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SUPPORTING ZERO-DEFORESTATION CATTLE IN COLOMBIA

FOREST CARBON, MARKETS AND COMMUNITIES (FCMC) PROGRAM

FEBRUARY 2015

This publication was produced for review by the United States Agency for International Development.

The U.S. Agency for International Development (USAID) launched the Forest Carbon, Markets and Communities (FCMC) Program to provide its missions, partner governments, and local and international stakeholders with assistance in developing and implementing REDD+ initiatives. FCMC services include analysis, evaluation, tools, and guidance for program design support; training materials; and meeting and workshop development and facilitation that support U.S. Government contributions to international REDD+ architecture.

This publication was produced for review by the United States Agency for International Development by Tetra Tech, through a Task Order under the Prosperity, Livelihoods, and Conserving Ecosystems (PLACE) Indefinite Quantity Contract Core Task Order (USAID Contract No. EPP-I-00-06-00008-00, Order Number AID-OAA-TO-11-00022).

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Please cite this report as:

Nelson, N. and Durschinger, L. (2015). "Supporting Zero-Deforestation Cattle in Colombia". USAID-supported Forest Carbon, Markets and Communities Program. Washington, DC, USA.

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ACRONYMS AND ABBREVIATIONS

ADB	Agricultural Development Bond
ADMB	Administrative and Decision Making Board
AGF	Agricultural Guaranty Fund
ANALAC	<i>Asociación Nacional de Productores de Leche</i>
ANDO	National Association of Industrialists
CAB	Colombian Agrarian Bank
CARs	<i>corporaciones autonomas regionales</i>
CMSCR	Mainstreaming Sustainable Cattle Ranching
COOPERIDEAL	<i>Cooperativa para a Inovação e Desenvolvimento da Atividade Leiteira</i>
DU	Development unit
EII	Earth Innovation Institute
EMPRAPA	<i>Empresa Brasileira de Pesquisa Agropecuaria</i>
ERP	Environmental Regularization Program
FEDEGÁN	<i>Federacion Colombiana de Ganaderos</i>
FIC	Forestry Incentive Certificate
FINAGRO	Fund for Financing the Agricultural Sector
FRS	Former Royalties System
FTFI	first-tier financial intermediary
GDP	gross domestic product
GEF	Global Environment Facility
GHG	greenhouse gas
GRS	<i>Sistema General de Regalías</i>
ILRI	International Livestock Research Institute
MARD	Ministry of Agriculture and Rural Development
MERCOSUR	<i>Mercado Común del Sur</i>
NAFTA	North American Free Trade Agreement
NGO	nongovernmental organization
NORAD	Norwegian Agency for Development Cooperation

NZAID	New Zealand Aid Programme
PES	Payments for ecosystem services
PMO	pasteurized milk ordinance
RCI	Rural Capitalization Initiative
RedES-CAR	Sustainable Enterprises Network
RER	rural environmental registry
SAN	Sustainable Agriculture Network
SDN	specialty designated national
SENA	<i>Servicio Nacional de Aprendizaje</i>
SPS	Silvopastoral Production Systems
STFI	second-tier financial intermediary
TFA	Tropical Forest Alliance
TNC	The Nature Conservancy
USAID	United States Agency for International Development

EXECUTIVE SUMMARY

Colombia is among the world's top cattle-producing countries, with more than 23 million head of beef and dairy cattle occupying approximately 38 percent of the total land area. It is challenging to clearly correlate deforestation with specific agricultural commodities in Colombia, but it is increasingly apparent that cattle production or movement of cattle into new areas is an opportunistic response from producers who take advantage of already-cleared land or hope to gain tenure informally by “improving” the land through cattle grazing. This behavior is at odds with government goals to increase productivity and decrease the amount of land under cattle production while increasing the number of hectares of non-livestock based agricultural commodities. Achieving this goal is made difficult by unclear land tenure status and processes, the strong cultural identity associated with cattle production, and local views on what ranching “should” look like, i.e., trees and cattle are seen as incompatible in the landscape.

Financing sustainable practices presents another challenge; grazing management practices often fail to benefit from economies of scale, and Colombia is no exception. The average cost to convert a single hectare to an intensive silvopastoral system is as much as US\$4,000. While some rural finance initiatives have managed to bring some of the costs down, the upfront costs of conversion are still largely the responsibility of the land owner and/or producer.

Even in a scenario in which the necessary, scalable financial products are in place and behavior changes have occurred, market forces and other factors will continue to influence the Colombia cattle sub-sector in ways that are unclear in the short term. Recent free-trade agreements with the United States and MERCOSUR make it challenging for Colombian dairy products to be competitive even in the domestic market, and price differentiation currently remains the only way for Colombian products to compete with higher quality, cheaper imports. There is little to no domestic demand for sustainably produced Colombian beef or dairy products. The export-driven demand outlook for Colombian products is also not particularly promising, as international food admissibility and (phyto)sanitary requirements are much more stringent than the standards currently upheld in-country.

Though the industry is currently dominated by 3 percent of producers—those with more than 500 animals—there are broad opportunities to better engage small- and medium-sized producers. Taking deforestation out of the cattle supply chains and making beef and dairy environmentally and financially sustainable sectors will require changing production practices as producers shift to intensifying production on existing land for increased productivity. Changing production practices will require upfront costs to farmers and/or lower returns during the period of transition from the old practice(s) to the new. For underperforming industries like Colombia's cattle sector, significant outside support may be required to implement sweeping reforms to boost productivity and improve the environmental soundness of agricultural activities. Technical assistance and/or interim financing from loans or grants are often a prerequisite for catalyzing change that will encourage producers to transition to zero-deforestation production.

Overcoming these barriers will only be achieved over time and will require coordinated technical assistance, participation by supply chain companies, and a significant amount of finance. The United States Agency for International Development (USAID) can further support sustainable supply chains in the long term by capitalizing on its substantial convening power in the development of shared metrics around new and existing financial instruments. In order of priority, Table I lists main recommendations to address the barriers.

TABLE I. MAIN RECOMMENDATIONS FOR ADDRESSING BARRIERS

Barrier	Proposed solutions
<p>Poor land-use governance and tenure in deforestation hotspots</p>	<p>Placing cattle on land for a prolonged period of time is an informal means of securing land tenure. However, a lack of formal tenure, particularly for smallholders, significantly restricts access to finance. Departmental or other jurisdictional strategies for land tenure tracking can help decentralize the formal tenure process and increase efficiencies to secure formal land tenure.</p>
<p>Little to no traceability of value chain products</p>	<p>Traceability can be achieved through implementation of municipal-level and farm-level certification of zero deforestation and by changing land-use laws and improving land tenure tracking. Promoting small producer associations (below) also opens up new opportunities for certifications and traceability.</p>
<p>Disparities in viability of interventions across geographies</p>	<p>Many small producers in the cattle sub-sector currently operate on a subsistence basis only, as they lack supporting infrastructure and market access for their products. Alternative livelihood activities should be considered for producers in regions where marginal costs are too high and where the cost of implementing sustainable land management and intensification may be too great. These activities must be assessed and managed appropriately so that alternative and more lucrative opportunities for small producers do not result in additional deforestation, as has been the case frequently in Brazil. In locations where beef and dairy productive chains can be improved cost-effectively, a variety (and most likely a combination) of interventions are available, including improved pastureland quality, breeding/genetics, health and sanitation, human capital, industry associations, and rural infrastructure.</p>
<p>Lack of domestic demand for sustainable beef and dairy products</p>	<p>Supply chain companies interviewed for this study felt there was no consumer demand for sustainable beef and dairy products from Colombia’s domestic market. Donor-supported efforts could be put in place to invest in building consumer awareness of sustainability and in providing credible and consistent labeling for end products.</p> <p>Corporate entities operating in these sub-sectors in Colombia also indicated that opening up such a niche market in the domestic context would be resource-intensive on their part. While generating demand for sustainable cattle products is in part an educational issue, most consumers in the Colombian context still look to price as the sole differentiator that drives their purchasing decisions. Even if demand can be built for those consumers that may be willing to pay a price premium for sustainable beef and dairy, it will be necessary to balance sustainability interventions (including those related the health and sanitation of dairy products) and costs to create domestic demand significant enough to be worthwhile for investors. Without this effort, there is a risk that investment will continue to be directed primarily to large producers to help them meet international quality and admissibility standards.</p>

Barrier	Proposed solutions
Lack of international demand for Colombian beef and dairy products	In the international market Colombia's beef and dairy products are largely non-competitive even when factoring in other differentiators that would command a price premium in certain markets, such as grass-fed beef. Colombia's products are also largely inadmissible in foreign markets due to health and sanitation requirements. Current support for addressing these issues focuses almost exclusively on large producers. In addition to transitioning certain producers in geographies with low potential for improvement to other income-generating activities, small producers must be better incorporated to improve their access to collection/aggregation points and allow them to benefit from technology that is otherwise unavailable to them. Achieving critical mass will be important for promoting both domestic and international demand for Colombian beef and dairy products.
Lack of associations for small producers	<i>Federacion Colombiana de Ganaderos (FEDEGAN)</i> , the country's main cattle industry group, primarily supports policy initiatives aimed at large producers – particularly those regarding improving competitiveness of the Colombian cattle sub-sector in the international market. Promoting additional and more robust cooperatives and other organizations focused on small producers will enhance collective bargaining power, potentially improving market access and access to technical and financial assistance.
Financing shortfall to support current policy objectives	<p>Current goals for intensification in the cattle sub-sector do not align well with existing and projected sources of finance, which are estimated at approximately \$60 billion annually in additional funding. In light of the aforementioned barriers, Colombia should revisit its land use objectives, giving consideration to areas where financing earmarked for the cattle value chain can be used most effectively, and where alternative income-generating activities may benefit more from economies of scale.</p> <p>In addition to mobilizing new sources of capital and realigning policy objectives with realistic financing scenarios, support should be provided to enhance smallholder access to adequate financial support and new financial products to promote the adoption of new practices. The ability to do so effectively will rely on strategies promoted above to enhance smallholder land tenure and improve small producer associations.</p>
Lack of necessary technology and infrastructure	Aside from a lack of formal land tenure, small producers are perhaps most disadvantaged by widespread inadequacies in general and industry-related infrastructure. A lack of well-maintained roads severely limits the ability of small producers to bring their products to market, and small dairy producers are especially hindered by a lack of refrigerators and other technology that preserves the quality and longevity of their products. While forming cooperatives and other producer associations may improve access to this technology for small producers, the larger infrastructure issues will require significant capital investment beyond what the cattle sub-sector can provide. Since improved roads and other infrastructure will benefit most agricultural and other industries in Colombia, sources for financing these types of projects may be more numerous and varied. However, the extent to which roads and other infrastructure are degraded across the country means that these upgrades must be targeted carefully to areas where the most producers will benefit, and loans for these upgrades may compete with other capital projects.

I.0 INTRODUCTION AND BACKGROUND

I.1 BACKGROUND

Large, commercial agriculture and timber enterprises are the principal agents of tropical deforestation, with four key commodities—soy, beef, palm oil, and pulp and paper—driving up to 50 percent of tropical deforestation. These drivers of deforestation differ by region. Soy and cattle are key in South America, while timber, paper, and palm oil are more important in Southeast Asia. Given that deforestation and forest degradation account for approximately 12 percent to 17 percent of global greenhouse gas (GHG) emissions, reducing deforestation by decoupling the production of these four commodities from environmentally degrading practices may produce meaningful reductions in global emissions and have significant additional environmental, economic, development, and social benefits. A number of organizations work to reduce commodity-driven deforestation. The Tropical Forest Alliance 2020 (TFA 2020) is a public-private partnership with the goal of reducing tropical deforestation associated with key global commodities such as soy, beef, palm oil, and pulp and paper.¹ TFA 2020 was born out of discussions between the U.S. Government and the Consumer Goods Forum, a network of more than 400 global companies with annual sales topping \$3 trillion.

Additional research is needed to: 1) understand the barriers (financial, technological, political, legal, cultural, etc.) faced by producers that transition to zero-deforestation commodity production; and 2) understand the options available to overcome financial barriers that will help to support this transition. Together, these two components will help explain the business case for transitioning to zero-deforestation commodities and how to move forward.

I.2 OBJECTIVE AND SCOPE

The objective of this report is to provide an assessment of production practices and their impact on deforestation for beef, dairy, and related products that TFA 2020 companies and their subsidiaries with operations in Colombia use.² The assessment was carried out to identify: 1) key barriers to shifting to sourcing and producing zero-deforestation cattle products (these barriers may be financial, technical, political, legal, and/or cultural); and 2) based on the identification of key barriers, provide a broad set of options to change to more sustainable production practices that will increase productivity while reducing or eliminating deforestation from the production of these goods.

¹ For more information on TFA 2020, please visit: <http://www.tfa2020.com/>

² These companies include The Kellogg Company, Colgate Palmolive, Kimberly Clark, The Coca Cola Company, SAB Miller Plc, Procter & Gamble, Unilever, Danone Ltd., Heinkel AG, Syngenta AG, Grupo Bimbo, Johnson and Johnson, Grupo Exito/Almacenes Exito, Nestle SA, and Carrefour SA. In some cases, this group would include their most active Colombian subsidiary/affiliate.

Understanding and addressing the barriers to developing a zero-deforestation supply chain is specific to the commodity as well as the scale of the producers. The options for addressing small producers' barriers likely will be very different from the options for addressing large holders' barriers, which some TFA companies like Unilever have begun to do.³ This report will examine both small-to-medium⁴ and large-scale⁵ producers when applicable, but it will focus primarily on small producers. Additionally, the specific functions and actors in the supply (value) chain for each agricultural product may have an impact on which sets of interventions will reduce barriers to producing zero-deforestation commodities. To leverage the purchasing power of the companies involved in the TFA and provide incentives for the Government of Colombia and for small and larger producers in the country, the assessment focuses on where there is an intersection between TFA companies in Colombia and the commodities they source locally.

The assessment aims to build on existing research and provide recommendations that go beyond current research and initiatives. The United Kingdom is providing up to £15 million in funding over four years (2013–2016) to support small- and medium-scale farmers to convert land currently used for open, extensive cattle grazing into silvopastoral systems.⁶ A recent report prepared by the Earth Innovation Institute (EII) and funded by the United Kingdom and Norwegian Agency for Development Cooperation (NORAD), entitled *Addressing Agricultural Drivers of Deforestation in Colombia*,⁷ has a comprehensive overview of the policies and development objectives that influence future land-use related to agriculture and livestock and provides a review of “trends and institutions” for the cattle, sugar, palm, and biofuels sector.

1.3 OVERVIEW OF LIVESTOCK-RELATED DRIVERS, AGENTS, AND UNDERLYING CAUSES OF DEFORESTATION IN COLOMBIA

There are few comprehensive studies on the drivers, agents, and underlying causes of deforestation in Colombia to date. The recent report *Addressing Agricultural Drivers of Deforestation in Colombia* identified the following, from greatest to least relative contribution: agricultural expansion, including pastureland; cultivation of illicit crops; internal migration; mining; and infrastructure development. When accounting for all forest-conversion activities, including those not identified as principal drivers, Colombia experiences an average deforestation rate of approximately 240,000 ha per year.^{8,9} Though the Colombian economy consumes approximately 4 million cubic meters of wood each year—and three-quarters of this demand is supplied by logging natural forests—timber products are not considered to

³ Learn more about Unilever's commitment to promoting sustainability and best practices among smallholder suppliers by visiting this website <http://www.unilever.com/sustainable-living/betterlivelihoods/farmers/>

⁴ Small producers in Colombia are those with 50 or fewer head of cattle, while medium producers have as many as 250 animals. Eighty-two percent of Colombian cattle producers are small producers, with nearly 50 percent of all producers having fewer than 10 animals.

⁵ Large producers have more than 250 animals in their herds and make up just 3 percent of all producers in Colombia.

⁶ Department of Energy and Climate Change. (2012). *Silvopastoral systems for climate change mitigation and poverty alleviation in Colombia's livestock sector*. Business case and intervention summary.

⁷ Nepstad et al. (July 2013). *Addressing Agricultural Drivers of Deforestation in Colombia: Increasing Land-Based Production While Reducing Deforestation, Forest Degradation, Greenhouse Gas Emissions and Rural Poverty*.

⁸ For the period 2005–2010. See Nepstad et al., 2013.

⁹ Nepstad et al., 2013.

be a principal driver. Deforestation is greater in non-protected areas with fertile soils and gentle slopes, and near settlements, roads, and rivers. However, there are no regional geographic databases of current information on the patterns and dynamics of land cover change,¹⁰ and often it can be difficult to spatially differentiate legal land use practices from illicit activities in order to accurately assess the causal relationship between drivers and their agents.¹¹ Many of the drivers are interrelated or cyclical – rural unrest or declining soil conditions can cause farmers to migrate, clearing new lands and abandoning lands that may recover but most likely will continue in a degraded state.¹² Some land-conversion processes may involve traditional practices that are themselves drivers, such as the use of fire to clear land or prepare soil for grazing.

Past deforestation patterns indicate that the contribution of agricultural expansion is significantly greater than any other principal driver. During the 2005-2009 period, for example, 90 percent of forests cleared in the Colombian Amazon and 80 percent of forests cleared in the Colombian Andes resulted in new pasturelands. However, it is not clear whether the deforestation occurred for the purpose of raising cattle or if the deforestation occurred for other reasons and cattle was then placed on the land. In general, the areas of Colombia with the greatest amount of pastureland as a percent of total area have the least amount of remaining natural ecosystems as a percent of total area.¹³ Though the clearing of forest for pastureland often is identified as the main factor responsible for forest loss,¹⁴ this process can be regionally complex and involve multiple types of land uses. Armenteras, Rodriguez, and Retana (2013) concluded that there are strong land use dynamics between three activities: the cultivation of illicit crops, fire, and pastures. Areas previously dominated by illicit crop cultivation in the Amazon are steadily becoming more pasture-dominant due to instances of rural unrest and the abandoned land that accompanies shifting cultivation to new locations.

Regardless of whether raising cattle was the underlying cause for deforestation, in Colombia there are currently 23 million head of cattle occupying 38 percent of Colombia's total land area (38.6 million hectares), with some of the lowest beef and milk productivity in South America. At the national level, the Government of Colombia plans to reduce the total area of pastureland by roughly 25 percent by 2019, or from 38.6 to 28 million hectares, while simultaneously boosting productivity. The primary vehicle for achieving this objective is the FEDEGÁN, using the *Strategic Plan for Colombia Cattle Ranching 2019* as a framework. Current stocking rates in Colombia are three hectares of land per head of cattle, compared to just one hectare per head in Brazil.

¹⁰ Armenteras, D. et al. (2006). "Patterns and causes of deforestation in the Colombian Amazon." *Ecological Indicators*, 6: 353-368.

¹¹ Armenteras, Rodriguez, and Retana. (2013). "Landscape dynamics in Northwestern Amazonia: An assessment of pastures, fire and illicit crops as drivers of tropical deforestation." *PLOSone*. 8:1.

¹² Nepstad et al., 2013.

¹³ Armenteras et al., 2006.

¹⁴ Armenteras, Rodriguez, and Retana, 2013.

2.0 DEMAND: TFA 2020 AND OTHER COMPANIES OPERATING IN BEEF AND DAIRY IN COLOMBIA

Several TFA 2020 member companies have operations or subsidiaries in Colombia. In order to execute their business objectives in the Colombian context more efficiently, some companies such as Danone have partnered with Colombian-based companies like Alpina. In considering these companies and the impact that their commitments can have on Colombia converting to sustainable and/or zero-deforestation cattle, one must also consider factors external to these commitments that may drive corporate priorities in the beef and dairy sectors. Additional details on corporate sustainability and/or zero-deforestation initiatives can be found in Annex I.

2.1 NESTLE

Nestle's Colombian operation makes it the third-largest food manufacturer in the country. Its 2012 sales were just fewer than US\$685 million. Nestle is also the third-largest buyer of milk in Colombia. To date, Nestle's sustainability initiatives have been limited to activities primarily revolving around the creation of dairy "districts" and the implementation of silvopastoral management practices to boost farmer profits and the quantity and quality of milk available. Under Nestle's "Dairy Development Plan," farmers in Nestle's milk districts commit to not deforest land in the process of cattle production, to generate new pasture areas, and to carefully manage water supplies. In exchange, Nestle works with farmers to advise on the latest technologies, animal nutrition, animal genetics, and farm infrastructure. The program is also a pilot for the implementation of silvopastoral systems. The program started with 13 pilot farmers and a total of less than 96 ha; today, Nestle's two milk districts in the Caqueta region of southern Colombia, where the company has had a presence for more than 35 years, produce a combined 226,000 tonnes of milk annually.

2.2 GRUPO/ALMACENES EXITO

Grupo Exito, also known as Almacenes Exito SA, is a recent new member of the TFA 2020 and the largest South American retail company operating directly within Colombia. It is Colombia's largest supermarket chain. In total, Grupo Exito operates 427 stores in Colombia across 83 municipalities and 23 states. In 2012, Grupo Exito sourced 88 percent of its materials from Colombia. As a portion of total purchases, domestic expenditures in 2012 accounted for 93.7 percent.¹⁵

¹⁵ Grupo Exito. (n.d.). "Our Suppliers". Retrieved from <http://www.grupoexito.com.co/index.php/en/our-suppliers>

Of its 2,598 Colombian suppliers, 2,664 are small- or medium-sized enterprises. Grupo Exito is a significant force in purchases of locally raised cattle, particularly as it looks to expand its sale of beef and other meat products in its stores. According to the most recent report, Grupo Exito sources much of its cattle from the Caribbean Coast, Villavicencio (Meta), and La Dorada (Caldas). Specifically, the cattle it purchases locally are high quality, natural-grazing Brahman cattle. Between 2010 and 2012, the number of cattle Grupo Exito purchased increased by more than 25,000 head to 103,127.¹⁶

Grupo Exito has had the support of local nongovernmental organizations (NGOs), such as *Solidaridad*, in developing models for zero-deforestation commodities. For example, the company recently signed an agreement with *Solidaridad* to ensure that all of the palm oil Grupo Exito sources in Colombia comes with a zero-deforestation certification. Grupo Exito has a similar agreement for coffee. Though the company is interested in pursuing a sustainable model for the beef it sources, it has been difficult due to shortcomings in information and challenges in studying the existing value chain. While Grupo Exito's focus on sustainable value chains for cattle—beef in particular—has been quite limited, the company is interested in seeing if platforms for zero-deforestation commodities, such as those developed by *Solidaridad*, can be applied to beef production in Colombia.

2.3 DANONE/ALQUERIA

Danone is the third-largest dairy firm globally. As a company, Danone has committed to eliminate deforestation practices in the supply chain. It does not have any quantitative sustainability goals related to dairy. Rather, it focuses on increasing productivity (litres/ha/year) and reducing the costs of production.¹⁷

Given that Colombia has low per-capita annual consumption of fresh dairy products at just three kilograms, Danone has recognized the potential for expansion in this area and has formed a partnership with Colombia's Alqueria, the country's third-largest food manufacturer. Alqueria sources its milk from approximately 6,500 local farmers, 1,000 of whom are considered direct suppliers. More than two-thirds of this group are small producers with average daily outputs of approximately 80 litres. Alqueria provides advice and assistance to farmers on topics ranging from microcredit financing to the reduction of production costs through the bulk procurement of fodder and fertilizer. Alqueria has engaged in two notable finance initiatives. The first is a partnership with microfinance lender Bancamia, which provides individual loan products to small dairy producers. The program engaged 435 small producers that sell milk to Alqueria through three intermediaries and divided them into two groups. One group received the loan product, while the other group served as the "control." The group that received the microloan product was enrolled in a unique payment process that reduced opportunity and transaction costs to producers while reducing risk for the bank.

2.4 ALPINA

Alpina is a Colombia-based dairy company with subsidiaries in Venezuela and Ecuador. It is the second-largest food manufacturer in Colombia and the second-largest in dairy. Its 2012 sales were just fewer than US\$750 million. The company is not a member of the TFA 2020. Alpina's primary sustainability objective is to implement sustainable livestock management strategies and be able to guarantee a

¹⁶ Grupo Exito. (2013). "Sustainable Development Report 2012". Retrieved from <http://www.grupoexito.com.co/images/Sostenibilidad/pdf/SustainableReport2012.pdf>

¹⁷ Interview with Fernando Fuentes, Danone-Alqueria

sustainable dairy supply for the foreseeable future. The company is still in the process of determining what best practices should look like and how they would be implemented, but goals include increasing productivity per hectare, achieving greater efficiency with fewer animals, and preventing deforestation and other negative environmental impacts that livestock-related activities cause.

At present, the company does not participate in any specific programs structured around these objectives. Rather, Alpina is working to consolidate its sustainability initiatives. The company has an agreement with *Empresa Brasileira de Pesquisa Agropecuária* (EMBRAPA), the agricultural research arm of the Brazilian Ministry of Agriculture. The EMBRAPA *Balde Cheio* (“Full Bucket”) model¹⁸ provides the methodology for identifying possible strategies to increase productivity per hectare, recover deforested areas within watersheds, and avoid rural-to-urban displacement due to low incomes in the dairy sector. To better achieve this goal, Alpina has partnered with Brazilian *Cooperativa para a Inovação e Desenvolvimento da Atividade Leiteira* (COOPERIDEAL), a research cooperative for development and innovation in dairy farming. COOPERIDEAL will help determine how best to translate EMBRAPA findings for the Colombian context. Thus far, Alpina has begun to apply the EMBRAPA model in a pilot in Narino department.

2.5 COLANTA

Colanta is Colombia’s largest food manufacturer and the largest food manufacturer in dairy, with 2012 sales of more than US\$900 million. Whether its dairy products are destined for the domestic or international market dictates Colanta’s decisions with regard to certifications and production standards. For both markets, product differentiation tends to be related to factors of quality and sanitation; standards are higher for the export market due to admissibility requirements, so a greater emphasis is placed on maintaining quality standards among producers generating milk for export. In both the domestic and international contexts, standards and product differentiation related to production practices and sustainability are not considerations.

Colanta’s dairy producers for the export market have adopted practices that allow their products to meet international admissibility requirements. The United States is just one market for Colanta’s dairy products, and products exported to the United States must adhere to a pasteurized milk ordinance (PMO). Colanta sources from nine different farms in Colombia to meet the U.S. PMO. These farms are inspected every three months; as a result, producers must maintain consistently high quality. To offset this relative burden, producers are paid \$45/L regardless of whether their milk eventually ends up being exported or not. Maintaining consistently high product quality can be challenging for producers, as they are often hindered by a lack of potable water, an ample supply of which is required to meet stringent sanitation and hygiene standards. Some producers are forced to acquire treated water from a third party.

¹⁸ The *Balde Cheio* program uses a methodology of the same name to provide social, environmental, and economic guidance for small livestock production systems in rural Brazil. This goal is largely achieved through farmer field days, called “development units” (DUs), which provide technology transfer and training in an intensive manner. The objective of the program is to empower rural extension professionals with knowledge about intensive dairy production, promote information exchange about applied technology and environmental monitoring, and have a positive social and economic impact on production systems that adopt technologies proposed by EMBRAPA; in short, the program works to increase income for small rural dairy producers while serving as a common baseline for researchers, extension agents, and producers alike to increase sustainability of livestock producing systems. The program celebrated its 15th year at the end of 2013, at which time it had more than 4,000 participating properties.

2.6 KEY POINTS FROM COMPANY INTERVIEWS

Overall, the companies profiled and interviewed for this assessment shared many similarities in their strategies for improving their beef and dairy value chains. Though each company wants to improve adoption of sustainable practices among their producers, each is in a different phase of identifying the best activities to meet their economic and environmental needs, and of implementing those practices. Existing initiatives are largely still in the pilot stage, impacting a very small percentage of Colombia's small beef and dairy producers.

Commonly, company representatives felt that they are largely on their own with regard to approaching their producers on matters of sustainability and zero deforestation within their value chains in Colombia. Each company had some ongoing initiatives—some catalyzed by company membership in the TFA 2020—but there was little if any overlap between similar companies working on similar projects, or between other domestically or internationally funded initiatives directed at the cattle sector. In the same vein, several companies stated that their own financial resources were not enough to implement the types of changes needed to generate real reform in the production of beef and dairy, and that complementary domestic and international programs would go a long way in implementing needed behavior change in producers that may be skeptical of currently offered interventions.

It is important to note that while there are some existing corporate pilot activities to improve sustainability among select groups of small producers, these activities affect a very small portion of beef and dairy producers in Colombia. Additionally, the potential for scaling has yet to be demonstrated. Figures related to concrete outcomes from existing corporate sustainability initiatives in beef and dairy are largely unavailable at this time.

Nestle reports the following productivity gains due to its activities in the dairy supply chain in Colombia:

1. Milk production per cow has increased from 4.8 l/day to 6.2 l/day.
2. Milk production per hectare increased from 1.8 l to 7 l.
3. Average animals per hectare have increased from .6 cows to 1 cow.
4. Average monthly farmer income has increased by 47 percent.
5. Overall, production has increased by 147 percent since the start of the project.

In total, average milk production in the “dairy districts” is up by 38 percent. Nearly 96 acres are under improved management to prevent erosion. Local employment increased to an average of two jobs/farm.

Overall, the profiled companies felt that a niche for sustainable beef and dairy products is at best a very small segment of Colombia's domestic market, and that opening such a niche would be extremely demanding of corporate interests. Though each company had some type of sustainability objective, the more pressing matters for their value chains seem to be quality-related, with an eye toward admissibility in foreign markets as well as hygiene and sanitation of beef and dairy products. In the current environment, retailers are forced to compete with low-cost imports of beef and dairy from the United States and elsewhere, which has resulted in an environment in which these businesses are able to compete only on the basis of cost. The only way that corporations can have a large impact on the production of sustainable beef and dairy in the current environment is by directing more financial resources and technical assistance toward the larger, technologically adept producers that make up the majority of production, with the additional focus of meeting the standards and requirements of the international export market. This strategy is obviously problematic in that it directs resources to already advantaged producers while underserving the needs and potential of the remaining 97 percent of producers.

2.7 OUTLOOK FOR EXPORT-DRIVEN DEMAND

Colombia is now the third-largest agricultural export market for the United States. The export markets for dairy and beef have grown by 34 percent and 133 percent, respectively, since 2011. The free trade agreement eliminated an 80-percent tariff on prime and choice beef originating in the United States; other tariffs will be phased out over 15 years. In the Colombian market, the United States is now “on competitive footing with beef imported from Brazil and Argentina.”¹⁹

Differences in the size and degree of development of the two countries’ economies and their agricultural sectors resulted in inherent asymmetries in the agreement. While Colombia’s domestic beef value chain already is at risk, further asymmetries such as the requirement that Colombia accept beef coming from animals older than 30 months risk flooding the Colombian market with cheaper, lower quality “industrial” beef. This has been an outcome of the United States’ bilateral trade with Mexico under the North American Free Trade Agreement (NAFTA). “It is unlikely that this situation can be reversed”²⁰ due to the inability of Colombian products to penetrate the U.S. market as a result of admissibility and sanitary/phytosanitary requirements. Language alluding to a bilateral push for improved sanitation and hygiene in Colombia included alongside the free trade agreement is nonbinding and expressed in conditional language.

Colombia also has a relatively recent trade agreement with MERCOSUR (Argentina, Brazil, Uruguay, Paraguay). Negotiating these bilateral and multilateral trade agreements has resulted in conflicts between the Government of Colombia and various agricultural interest groups. Cattle and beef interest groups are especially adamant that trade agreements hurt the Colombian beef supply chain. Gomez, Frank, and Parra (2010) used a partial equilibrium model to determine the impact on key supply chain actors due to the trade agreements (Table 2), particularly the impact of MERCOSUR beef exports on Colombia’s domestic beef market. While the net impact on consumer welfare is projected to be positive, producers and distributors will suffer negative economic impacts due to 1) falling beef prices; 2) a decline in the domestic beef supply; and 3) a decrease in derived demand for fed cattle and a reduction in the price of cattle, even as domestic demand for beef consumption rises.

¹⁹ FTA Article 5/16/14.

²⁰ Salamanca, Gomez, and Landinez. (2009). *Impact of the US-Colombia FTA on the Small Farm Economy in Colombia*. Oxfam International.

TABLE 2. WELFARE INDICATOR: CHANGE IN SURPLUS (US\$ BILLIONS) FOR KEY VALUE CHAIN ACTORS DUE TO BILATERAL TRADE AGREEMENTS.

	2012	2013	2014	2015	2016	2017	2018
Consumers	128	133	137	143	147	152	157
Distributors	-29	-26	-24	-21	-19	-17	-14
Beef Producers	-31	-30	-29	-28	-27	-26	-25
Total	53	61	69	77	86	94	102

Source: Reproduced from Gomez, Frank, and Parra 2010 as presented at the Agricultural & Applied Economics Association 2010 AAEA, CAES, & WAEA Joint Annual Meeting, Denver, Colorado, July 25-27, 2010.

In order for Colombian beef producers to remain competitive in light of these trade agreements, there must be two responses with regard to productivity. The first response must result in a reduction of marginal costs in order for Colombian beef to compete with imports, particularly those originating in MERCOSUR countries. At the same time, the second response must focus on increasing productivity (cost per kilogram produced) on an annual basis.

The analysis concluded that free trade of beef, especially with MERCOSUR, will increase Colombian consumer welfare by US\$157 billion when import quotas are eliminated in 2018. However, when holding Colombian beef production constant, producer welfare will decrease as a result of free trade by US\$25 billion in 2018. In order for the domestic beef supply chain to overcome these negative impacts, efficiency gains must be achieved through adoption of new technologies that will reduce marginal costs by 2 to 4 percent every year. Implementation of FEDEGÁN's strategic plan for the Colombian beef-producing industry may also play a key role in shielding producer welfare from the impacts of these trade agreements. However, FEDEGÁN acknowledges that assistance toward meeting international requirements would be limited to "export farms" selected for their high degree of technology adoption; these are primarily large producers. Even if the internal objectives of the sector could be attained, it is "unlikely" that accrued benefits would reach Colombia's small cattle producers.²¹

²¹ Salamanca, Gomez, and Landinez, 2009.

3.0 BEEF AND DAIRY VALUE CHAINS

3.1 ECONOMIC ROLE OF THE CATTLE SECTOR

The cattle sector contributes 20 percent of Colombia's agricultural gross domestic product (GDP) and makes up 53 percent of its livestock GDP. As a percent of total national GDP, the cattle sector contributes just below 2 percent. Households in Colombia typically spend 1 percent of household income on beef and dairy. Annual per capita consumption of beef in Colombia is 19 kg, while annual per capita milk consumption is 141 L.

The more longitudinal impacts of recent free-trade agreements on Colombia's cattle sector remain to be seen, but these agreements present unique challenges in the short and medium term for Colombia's small and medium producers, who are overwhelmingly the largest group of producers in Colombia's cattle sector. 82 percent of producers in Colombia have fewer than 50 head of cattle, while 47 percent have fewer than 10 head. Medium producers, classified as those with 50 to 250 head, make up an additional 45 percent of the sector. Large producers with herds of 250 or more animals make up just 3 percent of all producers in Colombia.

Cattle provide important employment opportunities, particularly for rural households, and certain sub-sectors and activities within the cattle industry are more labor intensive than others. Specialized dairy in Colombia generates approximately 7.9 jobs per 100 animals. Dual-purpose systems generate 5.5 jobs per 100 animals, while breeding generates 2.5 jobs per 100 head. Lastly, cattle-fattening generates just fewer than 2.5 jobs per 100 animals. Additional details on the structure and functioning of the beef and dairy value chains can be found in Annex II.

3.1.1 Cattle-producing Regions

There are 38.6 million hectares of land in Colombia dedicated to the production of livestock. All other agricultural activities take place on just over 5 million hectares of land. Policies and strategies currently being implemented aim to increase intensification of cattle systems and improve efficiency, among other objectives. Through these initiatives, livestock ideally would come to occupy just over 28 million hectares of land, while non-livestock based agricultural activities would expand to include a total of 14 million hectares.

Currently, cattle production occurs in four primary areas.

In Colombia's Andean valleys, cattle production is more intensive than in other parts of the country. Some cattle production areas overlap with coffee production in this region. Depending on the altitude/temperature, specialized intensive dairy farms can be found. Production is low risk and requires relatively few inputs. This region has faced increased demand for milk by processing plants, further driving a need for better management practices and intensification of production. Dual-purpose systems in this region are an important source of family labor.

Cattle produced in the Caribbean lowlands of Colombia's northern coast is similarly as important as cattle production in the Andean valleys due to the presence of a large number of cattle, but production

systems are more diversified in this region than in others. Extensive beef breeding is found alongside dual-purpose systems²²; in the coastal department of Bolivar, 86 percent of cattle systems are dual purpose. Twelve percent are beef-fattening systems. Grasslands make up 36 percent of agricultural lands, and cattle production systems account for 35 percent of rural employment.

Cattle production in the Andean plateau is characterized by fertile soil with abundant organic matter. In addition to intensive pasture-based dairy, the land is used for high value crop production. Cattle production is based on strip-grazing or rotationally grazed pastures.

The Amazon basin is the fourth cattle producing region and the one where cattle production historically has been associated with deforestation. Cattle production systems in the Amazon basin are almost exclusively pasture-based dual purpose systems.

The total number of farms with livestock in Colombia is 491,334, according to a 2007 FEDEGÁN survey. Antioquia, Casanare, and Meta departments have the largest cattle inventories, with 12 percent, 11 percent, and 10 percent of the total respectively.

3.1.2 Distribution of Total National Herd by Use

A 2013 report by FEDEGÁN found that Colombia is home to just fewer than 25 million head of cattle. Of the total national herd, 39 percent of cattle are used for breeding, 35 percent are double or dual-purpose, 20 percent are kept for fattening, and 6 percent are dedicated for dairy production.

Production systems considered dual purpose in Colombia are typically: 1) pasture extensive, the most common system and the cheapest system for milk production; 2) pasture improved extensive; or 3) pasture extensive with concentrate supplementation. Dual-purpose cattle in Colombia are usually a cross between *Bos indicus* x *Bos taurus*.

3.2 BEEF INDUSTRY SUMMARY

Colombia's beef value chain is relatively simple. Roughly 4.1 million animals are slaughtered annually to produce approximately 900,000 tons of meat, and 80 percent of meat is sold unprocessed. Product differentiation is based solely on two factors: 1) Storage temperature; and 2) Bone content (carcass/side, cut with bone, boneless, etc.)

The beef supply chain comprises the following actors/links:

1. Input suppliers (live animals, feed, salts, seeds, breeders, drugs and vaccines, machinery)
2. Primary producers (farmers)
3. Cattle traders participating in auctions, brokers, or underwriters
4. Slaughterhouses (public and private)
5. Wholesalers (specialist butchers, traders, wholesalers, dealers)
6. Food processing industry
7. Meat retailers (butchers, shops, domestic and regional supermarkets)

²² Used for both meat and dairy production.

8. Final consumers (restaurants, households, regional)

Cattle traders are primarily brokers, middlemen, and underwriters that serve as a bridge for farmers with low technological adoption.

Slaughterhouses are responsible for the separation of edible and non-edible (tallow, hides, etc.) components in addition to the slaughter of cattle. Generally, the same traders bringing animals for slaughter will also move animal products from slaughterhouses to wholesalers and retailers.

Law 89, passed in 1993, implemented a fee for dairy and livestock development that is collected at the time of slaughter or at milk collection centers. The money becomes the responsibility of FEDEGAN, who manages it as the National Livestock Fund. The Fund is primarily used to subsidize the export of livestock, meat, and dairy products, as well as to co-finance investment in complementary infrastructure in production areas. Dairy producers pay a fee that increased from 0.5 percent of the price per liter of milk sold to 0.75 percent in 1997. The fee cattle producers pay is 0.5 percent of the legal minimum daily wage per head of cattle, or about US\$4.50 per animal. The fee is collected when producers bring their 'primary' products for processing or aggregation. Cooperative dairy farms are exempt from these fees.

Overall, it costs US\$1.8 to produce one leg of beef in Colombia, according to a 2013 FEDEGAN report.

3.2.1 Limitations of the Beef Supply Chain

Factors primarily related to production systems and technology constrain the beef sub-sector of Colombia's cattle industry. In most cattle-producing areas, productive parameters related to biomass are low, reducing the competitiveness of Colombia's beef and dairy sub-sectors. Seasonal dry periods affect the productivity of grasslands, and only 3 percent of pasture and forage lands have access to irrigation. Limited management practices and grassland conservation further exacerbate productivity challenges. Compared to smallholders, who are particularly affected by pasture-related productivity issues, the more technically advanced producers in medium and large farms have a higher rate of improved pasture use. Small- and medium-sized producers tend to be more extractive in nature, with limited fertilizer use and little replanting or restoration of pastures.

A "linchpin" issue in the policy sphere, required for a robust and effective livestock program, corresponds to animal nutrition, which is related to pasture quality, choice/types of grass, appropriate management through the application of best agricultural practices, and rotational grazing programs. The use of interventions like electric fencing and rotational grazing has increased; however, most areas with livestock conduct rotational grazing, making it hard to maximize productivity per hectare.

Limitations to irrigation are another challenge for the beef sub-sector and are due to both the overall availability of water in livestock producing regions as well as a lack of infrastructure and an inability to meet the costs necessary to obtain new technology.

3.3 DAIRY INDUSTRY SUMMARY

The main dairy-producing regions in Colombia are the Atlantic Coast (34 percent); the Central region (31 percent); the Western region (28 percent); and the Pacific region (7 percent), which includes Narino, Cauca and Valle de Cauca.

Milk and dairy production in Colombia has grown steadily over the past 20 years. Today, Colombia is the third-largest milk producer in South America, the sixth-largest in the Americas, and the 23rd-largest in the world. Bogota and the larger department of Cundinamarca play a significant role in the market for dairy products in Colombia, accounting for roughly 25 percent of the total.

Colombia has just fewer than 10 million head of cattle involved in milk and dairy production, or 42 percent of the total national herd. Animals used for dairy production are typically categorized as being used for either specialized dairy production²³ or dual-purpose²⁴ production. The former production system accounts for roughly 6.5 percent of the total national herd, or 1.5 million animals. The latter accounts for 36 percent of the total herd, or 8.4 million animals. Fifty-two percent of production comes from specialized dairy systems (3.34 million L/year), and 48 percent comes from dual-purpose production systems (3.08 million L/year).

Dairy production in Colombia is low, averaging 4.5 l/animal/day. Comparatively, productivity in neighboring Uruguay and Argentina is 13 l/animal/day, and 25 l/animal/day in the United States. From 2000 to 2010, average dairy output increased by 2.2 percent, or from 5.5 million L/year to 6.53 million L/year. However, these productivity increases have not been particularly beneficial for individual farmers. Rather, they have served to absorb costs of production, whose baskets of costs are higher than the general prices in the market. Profit margins have decreased, so the amount farmers receive has decreased. Like beef, milk and dairy production is subject to seasonal and climatic variability affecting availability and productivity of pasture and thus the amount of milk produced.

Colombia has high cost of production compared with its competitors (India, Argentina, Uruguay, and New Zealand). To produce one liter of milk costs US\$0.50 in Colombia versus US\$0.35 per liter for its competitors.²⁵ This difference stems from variations in cost structuring that result in Colombia's dairy producers relying on concentrate-based animal nutrition products made from imported corn and soy, which experts argue is hindering the industry's growth.²⁶ Processing at the end of the dairy chain for products like cheese and milk powder is also uncompetitive due to a lack of efficiency. One ton of milk powder produced in Colombia requires 8,500 liters of milk. In New Zealand, one ton of milk powder requires just 7,300 liters.²⁷

The prices of Colombia's domestically produced dairy products are also not competitive. A ton of milk powder produced in Colombia costs approximately US\$5,000; a ton of imported milk powder costs US\$3,700.²⁸ Colombia's estimated 24.7 million head of cattle are not as productive as cattle in other dairy-exporting countries. A cow in Colombia produces approximately six liters per day, while cows in New Zealand produce 11.3 liters. Cows in the United States and Europe produce as much as 40 liters per day.

3.3.1 Limitations of the Dairy Supply Chain

FEDEGAN has four fundamental challenges for the dairy chain in Colombia, including:

²³ Specialized dairy systems have superior milk production compared to dual purpose. Specialized systems employ a different set of management practices, use more supplementation and rotational pastures, and ultimately produce higher quality milk with fewer total solids, which sells for a higher price than milk produced under dual-purpose systems.

²⁴ Used for both meat and dairy production.

²⁵ La Republica. (November 2013). "Migrar hacia un modelo exportador de leche depende de la reduccion de costos de produccion."

²⁶ La Republica, November 2013.

²⁷ La Republica. November 2013.

²⁸ La Republica. November 2013.

1. “A lot of milk, very little industrialization.”
2. Many suppliers and few buyers (five companies account for the purchase of 60 percent of the formal milk supply). Negative trends in the price of milk have resulted in a variety of actions on the part of both small dairy producers and the government. In addition to voluntary free milk days held by farmers lacking a market for their products,²⁹ the Government of Colombia has gotten involved in an attempt to help balance markets that have put downward pressure on milk prices in the country, resulting from various factors. As part of its effort to address what some have described as an ongoing “structural crisis”³⁰ among Colombia’s agricultural sectors, the Government committed to purchasing 40,000 liters of milk over the course of 15 months beginning in September 2013.³¹
3. High production costs absorb productivity gains achieved in the first link of the chain.
4. Asymmetrical exposure to free trade agreements negatively affects the price levels of domestic milk production and the income level of farmers. Exposure is asymmetrical down the value chain, and the impacts of Colombia’s trade agreements with the United States and *Mercado Común del Sur* (MERCOSUR) will likely be felt very differently by actors at different stages in the value chain. Dairy processors are likely to benefit, while risks associated with the agreement are largely borne by the country’s small dairy producers. To offset this dynamic, higher income due to increased exports must be transferred to the primary producers through higher prices for liquid milk. This action will offset a decline in income resulting from an influx of imported dairy products from the United States.³²

With regard to sustainability in dairy production, other key stakeholders in the industry have also identified challenges facing the sector. From a domestic demand perspective, there simply is not a significant niche for organic or otherwise sustainably produced dairy products at present. Such a market would be “hard to open”³³ in Colombia. Traceability is a similar challenge for corporate stakeholders; relatively few smallholders are included in the formal dairy value chain, and traceability ends at the collection center for those that can access the market at all. Nelson Guerrero of Alpina further elaborated on barriers to adopting improved milk production systems:

1. There is a general lack of knowledge—and poor knowledge management—related to sustainable livestock systems. Smallholders are skeptical that implementing proposed interventions such as silvopastoral systems will not increase productivity; producer mindsets are “a limitation.”
2. Land ownership challenges and smallholders’ fears that intensification will result in a loss of land.
3. At present, price differentiation is the only way to be competitive with imports.³⁴ In other words, the only way value chain actors will outcompete foreign products in the domestic market is if they lower prices below prices for imported goods.

²⁹ The Cattle Site. 2013. “Government announces daily milk purchase of 40,000 liters.”

³⁰ The Cattle Site, 2013.

³¹ The Cattle Site, 2013.

³² Salamanca, Gomez, and Landinez, 2009.

³³ Interview with Nelson Guerrero, Alpina. 27 August 2014.

³⁴ Interview with Nelson Guerrero, Alpina.

4. Private businesses feel it is entirely their responsibility to approach producers on issues of sustainability. Companies do not feel that the Fund for Financing the Agricultural Sector (FINAGRO) and other agencies provide adequate complementary support.
5. Similarly, an inadequate amount of international financial support limits the impact of private sector initiatives in the Colombian dairy sector.
6. Related still, it is challenging for any one company to implement value chain sustainability initiatives in Colombia in isolation. Broad change will require coordinated, simultaneous effort between the private sector, farm associations, public agencies, and others.

4.0 FINANCING SUSTAINABLE PRODUCTION

When evaluating financing requirements, it is important to consider the financing needed to promote a broad definition of sustainably produced cattle, including both the environmental and economic sustainability of production – not just reducing deforestation. The answers are not as simple as “if ranchers made more money they would not deforest,” because often raising cattle is not the reason for deforesting; rather, it serves as a low-cost way to place “improvements on land” and gain tenure over time.

This section reviews the main public and private financing sources that are available to the Colombia cattle sector including the size of these funds, the types of financial instruments provided, the eligibility requirements, and the potential for scaling.

The main supply of domestic funds to cattle ranching comes from four sources in Colombia: 1) FINAGRO; 2) Government of Colombia technical assistance through FINAGRO; 3) *Federación Colombiana de Ganaderos* (FEDEGÁN); and 4) *Sistema General de Regalías*. The private sector provides little capital to the cattle sector.

4.1 SUPPLY OF FINANCING

The following list provides a brief overview of the scalable³⁵ financial instruments available for the Colombian cattle sector and their potential for converting current production processes to more sustainable Silvopastoral Production Systems (SPS) in the medium and long term. More detailed information about the loan portfolio, including eligibility requirements, structure, available funding, and scaling potential of each entity’s offerings, appears in Annex III (FINAGRO) and Annex IV (General Royalties System).

³⁵ Scalable financial instruments are able to maintain and/or increase efficiency and/or returns in the face of increased demand for financial products.

TABLE 3. SOURCES OF PUBLIC AND PUBLIC/PRIVATE FINANCE FOR THE COLOMBIAN CATTLE SECTOR.

Source	Entity	Product Name	Product Types	Estimated Size (USD million)
Public/ Private	FINAGRO	Credit Portfolio	Credit lines for agricultural sector financing	US\$6.74 billion total loans in 2013 New loans in 2013: US\$674 million 34.7 percent to cattle US\$962 million was disbursed to small producers
		Agricultural Guaranty Fund	Loan guarantees to first-tier financial intermediary (FTFI)	US\$1.99 billion US\$1.74 billion has been awarded to small-size agricultural producers
		Rural Capitalization Initiative (RCI)	Subsidies provided to current FINAGRO recipients to reduce the producer's outstanding debt obligation for specific activities, including SPS once activities are completed	US\$69.76 million in 2013 ³⁶ Traditionally, small-size producers have been the main beneficiaries of the RCI program, representing 77.6 percent. Cattle producers represent 10 percent.
		Forestry Incentive Certificate	Direct payment for reforestation	US\$46.24 million More than doubled from 2012 to 2013
Public	General Royalties System – Regional Funds	Investment Funds	Used to finance social, economic, and environmental development projects at the regional level to promote regional competitiveness and regional equality	US\$1.855 billion
		Direct Allocation		US\$3.4 billion

³⁶ FINAGRO. (2009-2013). "Informes Anuales".

Source	Entity	Product Name	Product Types	Estimated Size (USD million)
Private	Banco Agrario de Colombia	40 different lines of credit and loans	A commercial agriculture and livestock bank with assets of nearly US\$12 billion	Total portfolio value: US\$10.6 billion (2014), of which 80 percent is agricultural; expected growth of 13 percent in 2015.

4.1.1 Government Subsidies and Incentives

The Government of Colombia provides various direct economic incentives and subsidies to the agricultural sector, ranging from product merchandising and international “put” option coverage to technical assistance and price supports. Sectors supported by these incentives and subsidies depend on various economic domestic and international factors, including the health of the global economy, international trade relations, international and domestic market demand and competition, and environmental/climatic conditions. For instance, the Government of Colombia is currently offering support to the Colombian rice, bean, corn, cotton, cacao, and coffee sectors given their price positions and competitiveness in both the domestic and international markets.

Of interest and applicability to the Colombian cattle sub-sector are the Ministry of Agriculture and Rural Development’s (MARD’s) technical assistance initiatives, operated through FINAGRO, which aim to increase small- and medium-size producer competitiveness and productivity. In 2013, MARD held requests for proposals for three different technical assistance products valued at approximately US\$85 million in total, covering both 2013 and 2014 fiscal years. Details can be found in Annex V.

4.1.2 FINAGRO

FINAGRO is a public-private sector second-tier financial intermediary (STFI) established in 1991 to correct a market failure by providing low-cost and affordable financial products to Colombia’s agricultural sector.

The largest financing line operated by FINAGRO is their loan portfolio, which is part of the Development Finance (*Financiamiento de fomento*). In 2013, FINAGRO’s total loan portfolio grew 10 percent from 2012 levels to COP \$12.6 trillion³⁷ (US\$6.74 billion), the largest value in the organization’s history.³⁸ In regard to producer size, 31 percent of the value of FINAGRO’s total credit portfolio in 2013 can be attributed to small producers, while 34 percent was attributed to medium producers, and 35 percent to larger-size producers.³⁹ Colombia’s cattle sector was the largest participant, with 34.7 percent of portfolio share, followed by coffee (11.5 percent), palm oil (9.8 percent), sugar cane (7 percent), and rice (4.2 percent).⁴⁰ In terms of product line, 2013 saw a total loan portfolio breakdown in

³⁷ In Spanish billion means millions of millions, or 10¹². For this report, all COP figures are converted to the use of trillion.

³⁸ FINAGRO. (2014). “Informe de Gestión Sostenible 2013”. Annual Report. Bogotá: Ministerio de Agricultura y Desarrollo Rural. p. 40.

³⁹ Ibid; p.41.

⁴⁰ Ibid.

Working Capital of 15 percent, Capital Investment of 76 percent, and Balance Sheet Normalization of 9 percent.⁴¹ With respect to producer size, COP \$1.8 billion (US\$962 million) was disbursed to small producers, while another \$1.8 billion (US\$962 million) was disbursed to medium-sized producers. COP \$3.4 million (US\$1.82 billion) was disbursed to large-size producers.⁴² Despite the majority of financing being directed to larger producers to address issues related to competitiveness, FINAGRO has an increased opportunity to help stimulate sustainable production among Colombia's small producers through its signing of the *protocolo verde*, or green protocol. This recently signed cooperative agreement between the national government and the Colombian financial sector seeks to generate environmental and social benefits. This goal will be achieved in part through a commitment from the financial sector to promote new and diverse financial instruments for activities with social and environmental benefits, while the national government simultaneously promotes the creation of new lines of finance for the execution of programs in sustainable production systems with an eye toward external export markets.

FINAGRO's loan products represent the bank's largest product line; as such, they have a high scaling potential. FINAGRO aims to grow its loan portfolio between 5 percent and 10 percent annually so as to formalize a rather informal Colombian agricultural sector.⁴³ In terms of specific credit allocations to the cattle sector, FINAGRO is a demand-driven financial intermediary operating in a well-diversified national agricultural sector. Therefore, FINAGRO does not establish portfolio targets or limits for certain sectors or geographies, because credit demand has been quite diversified.

Details on FINAGRO's full line of financing products and their implications for sustainable cattle are included in ANNEX III.

4.1.3 FEDEGÁN

Created in 1963, the Colombian Cattle Ranching Association (*Federación Colombiana de Ganaderos, or FEDEGÁN*) is the leading cattle sector trade association in Colombia. As such, it represents all local, regional, and national trade associations related to and operating in the Colombian cattle sector.⁴⁴ With the mission to increase the cattle sector's productivity and competitiveness, FEDEGÁN looks to promote modern production processes and the effective integration of productive supply chains in order to contribute economic development, reduce social inequalities, and conserve peace throughout the county's rural areas.⁴⁵

Currently, FEDEGÁN manages four programs: (1) FEDEGÁN, which focuses on regional trade association capacity building, Foot and Mouth Disease vaccine distribution, lowering of cattle production costs, and trade association forums and conferences; (2) National Cattle Fund (*Fondo Nacional del Ganado, or FNG*), which focuses on a variety of topics, including animal health, science and technology, productive supply chains, consumption promotion, and socioeconomic studies; (3) Stabilization Fund for the Promotion of Meat and Dairy (and their Derivatives) Exports (*Fondo de Establización para el Fomento*

⁴¹ Ibid.

⁴² Ibid.

⁴³ Ortégón, R.M. (31 July 2014). Director, Crédito e ICR, FINAGRO. Natalia Arango and Peter Greenwood.

⁴⁴ FEDEGÁN. (2014). "FEDEGÁN". Retrieved from <http://www.fedegan.org.co/quienes-somos/fedegan>. Accessed 30 July 2014.

⁴⁵ FEDEGÁN. (2014). "Mision y Vision". Retrieved from <http://www.fedegan.org.co/quienes-somos/mision-y-vision>. Accessed 31 July 2014.

de la Exportación de Carne, Leche, y sus Derivados), which focuses on international market and trade research as well as international price fluctuation coverage; and (4) Fundación Colombia Ganadera (FUNDAGÁN), which focuses on FUNDAGÁN's corporate social responsibility initiatives.⁴⁶

FEDEGÁN's main source of funding originates from the annual collection of the Cattle and Dairy Development Quota, which is paid to the trade association by Colombian producers (individuals and enterprises) that produce meat and/or dairy domestically.⁴⁷ The quota is approximately 0.75 percent of the price per liter of milk sold or 75 percent of the current daily minimum salary, per cattle head, at time of slaughter.⁴⁸ From this collection, FEDEGÁN finances all of its operations throughout the country, including its core activity of distributing Foot and Mouth Disease Vaccine and technical assistance initiatives at the trade association, supply chain, and producer levels.

Of all of FEDEGÁN's activities, perhaps the most significant capital mobilization mechanism is the Global Environment Facility's (GEF's) Sustainable Colombian Cattle Project, which FEDEGÁN manages and coordinates, totaling US\$37 million.

4.1.4 General Royalties (Sistema General de Regalías – GRS)

Since its inception in 2012, the GRS has had an aggregate three-year budget of COP \$21.9 trillion (US\$11.65 billion), of which COP \$12.05 trillion (US\$6.42 billion) represents approved projects.⁴⁹ Of the projects approved during this time frame, approximately 7.9 percent (US\$506 million) correspond to the agricultural sector, and 0.14 percent (US\$8.89 million) of this approved amount corresponds to the cattle-producing sub-sector.⁵⁰ Leading the agricultural sector is the transport sector, with 31.4 percent of all approved projects; the housing and urban development sector, with 14.16 percent; and science and technology, with 12.43 percent.⁵¹

Given the amount of resources available in the GRS, this particular mechanism has a high scaling potential for the Colombia cattle-producing sector. However, civil society participation by individual, small-, and medium-sized producers in GRS financing applications will have to increase in order for the cattle sector to capitalize on this opportunity. Currently, the majority of approved GRS applications come from local government authorities. As such, approved projects are in sectors that can demonstrate rapid and observable improvements in public-good sectors (i.e., transport infrastructure). Conversely, the cattle sector does not have as many apparent demonstrable public-good impacts as other sectors do.

Details on GRS and its implications for sustainable cattle are included in Annex IV.

⁴⁶ FEDEGÁN. (2014). "FEDEGÁN". Retrieved from <http://www.fedegan.org.co>. Accessed 31 July 2014.

⁴⁷ FEDEGÁN. (2014). "Recaudo Cuota del Fomento Ganadero." Retrieved from <http://www.fedegan.org.co/programas/recaudo-cuota-del-fomento-ganadero>. Accessed 31 July 2014.

⁴⁸ Ibid.

4.1.5 Major Donor Programs

4.1.5.1 Proyecto Ganadería Colombiana Sostenible

The Colombian Sustainable Cattle Project is a joint initiative between FEDEGÁN, the Center for Investigation in Sustainable Agricultural Production Systems (CIPAV), The Nature Conservancy (TNC), and the Action Fund. The project is funded by GEF, the Colombian Department of Energy and Climate, and the United Kingdom International Climate Fund. The project's objective is to promote the development and use of silvopastoral systems in Colombia's cattle sector with the end result of improving natural resource management, increasing sector productivity and competitiveness, and facilitating the provision of environmental services (biodiversity, land, carbon, and water). The project commenced in June 2010 and will run for five years.

The project was funded with a US\$7 million grant from GEF, US\$13 million from local civil society project partners (FEDEGÁN, CIPAV, Fondo Acción, and TNC), and US\$22 million in credit and RCI financing from FINAGRO for a total project amount of approximately US\$42 million.⁵² Recently in 2014, the Government of the U.K. capitalized the project with an additional £15 million.⁵³

Through an open call for proposals between June 13 and July 13, 2011 and June 4 and August 3, 2012, the project targeted both small- and medium-size producers with rural estates in five selected priority cattle-producing regions⁵⁴ throughout the country. Eligibility requirements for the call for proposals included the following:

- Have cattle-producing operations in at least one of the five priority cattle-producing regions;
- Demonstrate that cattle ranching is the primary economic activity of the applicant's rural estate;
- Demonstrate that the applicant is the legal proprietor, good faith holder (for at least five years), or property holder for at least one year with the intention of being the property holder for the next five years of the property in question;
- Declare that there is no existing judicial decision or lawsuit in relation to the property in question;
- The legal proprietor, good faith holder, or property holder has not been convicted and/or condemned for crimes related to genocide, terrorist acts, forced disappearance, kidnapping, human trafficking, production or distribution of drugs, trafficking of substances used in to processing of narcotics, drug trafficking, torture, rebellion, forced displacement, extortion, money laundering, conspiracy, and other related offences, and has not belonged to and does not belong to armed groups operating on the margin of the law;

⁵² The World Bank. (2014). "Project Paper: Mainstreaming Sustainable Cattle Ranching in Colombia. Internal Report. Washington D.C.: The World Bank.

⁵³ Ibid. p. 11.

⁵⁴ The milk-producing regions that formed the basis for this study were divided as follows: a) 145 farms in the lowlands of the Savannas piedmont (states of Arauca, Casanare, and Meta); b) 116 in the lowlands of the Caribbean region (Atlántico, Guajira, Magdalena, César, Bolívar, and Córdoba states); c) 105 in the midland of the coffee growing area (Quindío, Valle, Caldas, and Risaralda); d) 97 in the mountain highlands of Antioquia; and e) 82 farms in the Highlands of the Savanna Cundiboyacense (states of Cundinamarca and Boyacá).

- Farmland whose legal proprietor, good faith holder, or property holder is not a “specially designated national” (SDN)⁵⁵;
- Applicants have not deforested more than 5 percent of the forestland of their farmland during the past three years; and
- The property, possession, or holding of the farmland is not associated with forced displacement processes or other forms of illegal holding.⁵⁶

In total, 83 municipalities and 1,700 individuals will benefit, with two “hotspots” in La Guajira and Meta. The average amount of assistance rendered via payments for environmental services is approximately US\$3,946 per farm, per year. Estimated up-front costs of conversion under the project follow:

1. Biodiversity Payments for ecosystem services (PES) – Average: US\$3,228⁵⁷
2. Carbon PES – Average: US\$305/ha⁵⁸
3. Annual CI verification – Average: US\$324/farm

After the two calls for proposals, 2,497 properties were selected for project implementation.⁵⁹ In total, these properties cover 113,707 hectares, of which 72 percent were small-size producers, 21 percent were medium-size producers, and 7 percent were large-size producers.⁶⁰ All 2,497 properties will receive technical assistance, while 814 will receive both technical assistance and the corresponding PES⁶¹. As of June 2013, approximately 143 properties had received PES totaling COP \$77,596,404 (US\$43,733).⁶²

Projected outcomes and productivity gains are expected in three areas. The first is improved methodologies and production techniques, with the goal to extend and increase coverage of technical assistance from 9 percent of participating properties in 2012 to 17 percent in 2017. The second is strengthening associations of small farmers through commercial partnerships, which is expected to increase the number of small producers that are members of a cooperative from 1.3 percent to 5.5 percent. Lastly, the program aims to improve the quality of milk produced by producers in the formal production chain.

⁵⁵ Under U.S. regulations, SDNs are individuals, groups, or companies owned by or acting on behalf of either a targeted country, or in Colombia’s case, an entity engaged in illegal activity. The Office of Foreign Asset Control has a list of SDNs .

⁵⁶ FEDEGÁN, GEF, Fondo Acción, and TNC. (2011). *Covocatoria Proyecto Ganadería Colombiana Sostenible: Términos de Referencia*. Bogotá. pp. 12-13. And FEDEGÁN, GEF, CIPAV; Fondo Acción, and TNC. (2012). *La Oportunidad de Mejorar Su Negocio Ganadero: Segunda Convocatoria*. Bogotá. p.1.

⁵⁷ Project does not cover conversion costs; these are borne by the farmer. Average conversion costs are estimated to be approximately US\$2,000/ha.

⁵⁸ Project does not cover costs to convert to intensive silvopastoral systems. Average conversion costs are estimated to be approximately US\$5,000/ha.

⁵⁹ FEDEGÁN. (2013). “Ganadería Colombiana Sostenible: Cómo Vamos?” Retrieved from <http://www.fedegan.org.co/programas/como-vamos>. Accessed 1 August 2014.

⁶⁰ Ibid.

⁶¹ Ibid.

⁶² Ibid.

With regard to the involved actors, FEDEGÁN coordinates the project and serves as the entity that administers the GEF funds donated to the project; it provides SPS technical assistance to participating producers.⁶³ The Bogotá-based conservation trust fund, Fondo Acción, is responsible for administrating the call for proposals and making the PES payments to participating producers.⁶⁴ CIPAV is responsible for ensuring that the sustainable cattle-producing practices are implemented at participating producers' farms. Finally, TNC is in charge of selecting and monitoring the priority areas, and project effects therein, of participating producers' farms.⁶⁵

Given the involvement of well-experienced stakeholders and the large amounts of allocated capital, this initiative could be scaled quickly to include a higher number of multilateral and bilateral financing sources in addition to increased commitments from FINAGRO, the Colombian financial services sector, and Colombian civil society. However, to achieve further scaling, it is imperative that the Colombian financial services sector become involved, providing credit to cattle producers for SPS. Additionally, it is important that concrete lessons learned be documented from this project's experience to achieve full scaling in technical assistance methodologies and PES payment schemes as well as in aligning incentives between cattle producers and possible private sector capital providers.

4.1.5.2 Colombian Dairy Value Chain Initiative – The 'Colwi' Program

The Governments of New Zealand and Colombia, with funding from the New Zealand Aid Programme (NZAID) support the Colombian Dairy Value Chain Initiative. The project expects to disburse approximately US\$3-3.5 million over four to five years.

The project is aimed at livelihood improvement, primarily for small producers with fewer than 30 animals. Main activities include implementation of integrated farming systems and linking farmers to integrated supply and value chains. Elements of these activities include soil analysis, pasture selection, fertilizer, pasture management, animal husbandry, finance, and economics.

First-stage implementation will focus on: 1) baseline farm and livelihood analyses of pilot farms; 2) farm planning for pilot farms (requires participation of specialists from both New Zealand and Colombia); and 3) start of farm development and monitoring on pilot farms. The project will support peer-to-peer dissemination of knowledge and technology from the initial 40 pilot farms, with a long-term objective of extension/education programs with vocational institutions and universities.

The 40 pilot farms are members of five different associations: one indigenous association in Narino, two additional associations in Narino, one in Cundinamarca, and one in Boyaca. The project expects outcomes in three primary areas. The first outcome is to increase both productivity and profitability for micro, small-, and medium-sized Colombian dairy farmers through adoption of relevant practices and systems from the New Zealand cattle sector. The second is to increase the capacity of Colombian extension agents to lead change among producers to adopt these practices and systems. The third outcome is to increase the capacity of Colombia's national training organization, *Servicio Nacional de Aprendizaje* (SENA), to deliver short training programs on these practices and systems.

⁶³ FEDEGÁN. (2013). "Ganadería Colombiana Sostenible". Retrieved from <http://www.fedegan.org.co//programas/ganaderia-colombiana-sostenible>. Accessed 1 August 2014.

⁶⁴ Ibid.

⁶⁵ Ibid.

4.1.5.3 *Implementation and Validation of Alternative Models of Livestock Production in the Department of Caquetá*

This program in the Colombian department of Caqueta is intended to help livestock producers adopt good agricultural, environmental, and social practices in the framework of the Sustainable Agriculture Network Standard for Sustainable Cattle Production Systems.⁶⁶ Specifically, the program takes a holistic approach and is intended to address the following:

1. On-farm business management
2. Conservation of natural resources
3. Establishment of hedgerows
4. Biodiversity protection
5. Efficient water management
6. Improved health and safety of workers
7. Soil conservation
8. Agroforestry
9. Efficient pasture management
10. Other practices that allow for certification or verification with the Rainforest Alliance as a tool for connecting to sustainable value chains.

The program targets nine municipalities (Chaira Cartagena, El Doncello, Paujil, La Montanita, Milan, Puerto Rico, San Jose del Forge, San Vicente del Caguan, and Albania) with an affected population of 465,487 based on recent census data. The target population within that figure is 221,936 individuals.

4.1.5.4 *Low Carbon Agricultural Project with Colombia*

This project promotes sustainable silvopastoral systems to encompass a range of different agroforestry practices. These include the addition of trees to pastures, the creation of living fences, fodder banks, grazed timber plantations, and intensive silvopastoral systems (ISPS). ISPS is a subset silvopastoral system that is especially well-suited for tropical areas. ISPS consists of planting fodder shrubs at high density, intercropped with improved, highly productive pastures and timber trees, and all combined into a system that can be grazed. The Government of the United Kingdom supports this project via its International Climate Fund.

The project is intended to benefit at least 1,500 Colombian farmers in seven regions. Seventy percent of these farmers will be small scale, with maximum land holdings of 70 ha. The other 30 percent will be medium-sized producers with a maximum of 200 ha. Five of the project regions overlap with an existing World Bank project in Colombia, the Mainstreaming Sustainable Cattle Ranching (CMSCR) project. The other two are new areas of focus that would extend existing production areas into known deforestation hotspots. The magnitude of this latter intervention is still being determined.

The estimated costs of conversion are broken down as follows:

⁶⁶ A standard promoted by the Sustainable Agriculture Network (SAN), a consortium of international nonprofit organizations focused on biodiversity conservation and rural development.

1. For implementation in an existing project area, the average cost of conversion is US\$757/ha.
2. For implementation in existing areas plus neighboring deforestation hotspots (preferred), the average cost of conversion is US\$845/ha.
3. For implementation in existing areas plus geographically distinct deforestation hotspots, the average cost of conversion is US\$925/ha.
4. Across all new areas, the average cost of conversion is US\$1,444/ha.

Expected areas of impact for the project include producer incomes, which are expected to increase by 50 percent/ha of land converted from degraded pasture to SPS. Seven years after the establishment of SPS, stocking rates will likely double. Total farm incomes are expected to rise, and a 10-percent increase in milk and beef production is expected from establishing ISPS in participating farms. Furthermore, a 20-percent increase in productive assets-based patrimony of small-scale livestock producers is expected.

The main challenges identified by the project to date are difficulty recruiting small producers to the project, the potential of the project to drive expansion of cattle areas due to the incentive created by increased on-farm productivity, and the fiduciary risk of funds not being used for their intended purpose.

4.1.5.5 Budget Support from the European Union for the Colombian Dairy Sector

The European Union supports this project, which has two phases. The first phase is aimed at improving productivity and quality of milk in Colombia. This result is achieved through the development and financing of programs to reduce production costs, implementation of ISPS, and improving land for pasture renovation. Other objectives of phase one include improved milk quality through the implementation of a milk quality management system, and the provision of specialized technical assistance to small producers, including accessory services and business strengthening.

Estimated costs of conversion for phase one are based on cost estimates from Colombia's RCI program. The average cost of implementing SPS in Colombia is estimated to be US\$4,000/ha; through RCI, this cost could be closer to US\$1,600/ha.

Phase two of the project focuses on two additional activities to promote the dairy value chain. The first is to increase the productivity and competitiveness of the various links within Colombia's dairy sector. Specifically, the project will help facilitate productive transformation of the sector by promoting and formalizing partnerships and contributing to the formation of industry clusters. The project will also develop a process for technical assistance in the areas of pasture management, milk collection, and marketing. The second objective is to bring a total of 17,000 hectares under SPS and/or improved grasslands (reconverted systems).

4.2 DEMAND FOR FINANCING

Similar to many other sectors in Colombia, there is much informality in agriculture. This informality, characterized by a lack of property and/or land tenure rights and limited business education, is further deepened by a rural culture that operates on a short-term subsistence timeline rather than one of medium- to long-term horizons. Firstly, property and land tenure rights always have been issues for entrepreneurs in Colombia in both urban and rural settings. It continues to hinder potential productivity gains in the agricultural sector, because productive investments cannot be made without adequate capital – and adequate capital cannot be provided without a robust collateral package of fixed assets.

Secondly, the level of financial literacy of the average small- and medium-sized agricultural producer is quite limited, which leads to mistrust in formal financial institutions and pushes such producers to informal sources of financing from locally based connections and networks. For instance, many

producers do not understand loan concepts such as the difference between monthly and annualized percentage rates. Therefore, these producers are often mistakenly caught taking a local network loan at a 5 percent – 6 percent monthly rate instead of considering a formal channel loan with a 10 percent – 14 percent annualized rate.

5.0 BARRIERS TO DEFORESTATION-FREE PRODUCTION AND SOURCING

The government has established policies and goals promoting more efficient and sustainable cattle ranching. Key measures needed for sustainability, as identified in most studies, include more technical assistance to support conversion to sustainable practices, funding to implement new practices, and changes in supply chain purchasing practices.

The barriers to conversion to sustainable production of beef and cattle in Colombia can be divided into two categories: 1) elimination of deforestation associated with cattle ranching; and 2) adoption of environmentally, financially, and socially sustainable beef and milk production on existing grazing lands. The first goal requires a lower capital investment than the second goal. Reaching the second goal involves overcoming the barriers to increasing productivity and profitability per hectare on existing cattle lands.

5.1 ELIMINATING DEFORESTATION ASSOCIATED WITH CATTLE RAISING

In recent years, there is little evidence that new deforestation is occurring with the objective to make money for cattle ranching. More commonly, areas are cleared for reasons unrelated to the income associated with ranching, and then cattle are placed on land to secure tenure.

Changing this behavior that opens land that then becomes pasture is therefore far more complex than addressing cattle production practices. It requires changes in land tenure laws that reduce the ability to acquire property ownership through adverse possession, which is regularly used in Colombia. But if the constraints of 1) little to no domestic demand or other incentive⁶⁷ for certified zero-deforestation products; and 2) an export market with inconsistent/limited demand for zero-deforestation cattle could be overcome, this effort could contribute greatly to discouraging ranchers from using deforested land or, where it is occurring, directly causing deforestation. There is currently little or no market incentive for early adopters of sustainable beef production.

⁶⁷ In Brazil, civil society pressured supermarkets and others in the supply chain to only purchase zero-deforestation beef. This action allowed targeting a smaller number of buyers who could influence the market rather than creating demand within the general population. Read more at <http://www.resilience.org/stories/2014-07-03/how-brazil-has-dramatically-reduced-tropical-deforestation>

However, if demand for certified sustainable beef and dairy within the current Colombian buyers and/or their end consumers can be built, then the barrier would be implementing the certification/tracking systems within the supply chain to track products from production to table. These systems could operate at the ranch level and/or jurisdiction level and provide cost effective certification of beef and dairy products as they move into the supply chain. Deforestation accounting may be performed at the jurisdictional level, which removes many of the more complex traceability requirements, because municipalities and/or departments who can certify that they have net zero deforestation can then supply certified zero-deforestation beef and dairy products. While this approach may simplify the traceability requirements and certification process, it also exposes ranchers to the tragedy of the commons, in which others' deforestation may negatively impact the value/marketability of ranchers' products. Certification at small geographic levels, such as the individual ranch level, can remove this problem; however, it becomes more difficult to maintain as the products move through the supply chain. But these are relatively simple technical issues that can leverage existing certification systems and technology, leaving the challenge to convincing buyers to demand zero-deforestation beef and dairy products. While some standardization is helpful in Colombia's adoption of certification approaches, a mixture of approaches can be adopted to fit the dynamics of production in a particular area.

5.2 INCREASING PRODUCTIVITY AND PROFITABILITY PER HECTARE ON EXISTING CATTLE LANDS

Colombia's National Development Plan intends to promote intensive silvopastoral systems and reduce pasture land from 38 million hectares to 28 million hectares by 2019 while increasing cattle from 23 million head to 40 million head. This goal implies going from a stocking rate of 0.6 per hectares to 1.4 per hectare, i.e., 2.5-fold increase. As such, 10 million hectares need to be converted to non-rangeland, while the remaining land would need to be successfully converted to ISPS to meet the productivity requirements that the government targets. Achieving this result will require creating the right incentives, providing targeted technical agronomic assistance, and effectively delivering the required funding. The funding needs to cover the initial cost of conversion, but the practices can only be maintained in cases where the economic returns to the producers are sustainable and greater than income generated by ranching on larger areas of land.

5.2.1 Producer-Side Factors

5.2.1.1 Agronomic Technical Assistance Requirements

The complexity of ISPS demands specialized knowledge and technical assistance. Ranchers and extension agents both cite the lack of high quality technical assistance available to the small- and medium-sized agricultural producer segments as one of the biggest supply-side barriers. Conversion requires the adoption of new practices that include planting/promoting shrubs as fodder and improving grasses and trees. Agronomic assistance to evaluate the appropriate activities for a given ranch, develop a technical and financial implementation plan, and then provide technical expertise to ranchers to plant and maintain shrubs and trees is the only way adoption will reach scale.

There are many forms of available technical assistance that assist these producers to enhance their business operations, processes, and administration so that they will be more attractive potential borrowers to formal credit institutions, including FINAGRO. However, sector stakeholders (Government of Colombia, local governments, trade associations, financial intermediaries, and private enterprise) provide very little technical assistance to assist these producers in enhancing productivity and developing business models once they have outstanding credit positions. If loans are provided based on business models, it is completely up to the producer to successfully implement it once financing has been secured. Secondly, it has been emphasized that extension professionals providing the technical

assistance to small- and medium-sized producers need to further deepen their subject matter knowledge and expertise to provide more comprehensive and effective training to these producer segments. There is a belief that extension services are inadequate in scale and currently overestimated in terms of impact and capabilities.

5.2.1.2 Financing SPS

As highlighted in Section 4.2, Colombia's agricultural sector is characterized by a high level of informality resulting from, among other things, lack of adequate property and land tenure rights, short-term, subsistence producer culture, and low levels of financial literacy among small producers. This low level of literacy and lack of familiarity with types and varieties of financial products results in producers securing local loans at unfavorable monthly rates, rather than more manageable annualized rates. While a 10 percent – 14 percent annualized interest rate from FINAGRO and its FTFI partners is relatively low compared to typical commercial credit products in Colombia, critics state that these figures are quite high relative to rural financing structures available in other Latin American markets. Thus, these interest rate figures may cause sticker-shock for small- and medium-sized producers, which may then lead them to look for more informal finance channels with less favorable terms.

Barriers identified for small- and medium-scale farmer participation primarily relate to compliance with conditions necessary to access FINAGRO's credit lines (e.g., lack of land titles and initial capital to assume transaction costs) and little interest from farmers in becoming financial system users. Proposed mitigation measures include: 1) strengthening producer associations for collective approaches to project instruments; 2) in the framework of the project's Public Policy Committee, discuss with the MADR-FINAGRO any barriers encountered by small- and medium-sized farmers to access FINAGRO loans and ICR to allow for flexible conditions for SPS applicants, as required; offering specific training to FINAGRO operators evaluating credit applications for SPS implementation; and consider setting up a special team within FINAGRO to focus only on small farmer applications; and 3) considering microfinance and credit alternatives that the Government of Colombia and other institutions such as the *Bolsa Nacional Agropecuaria* (National Agriculture and Livestock Market) or the Biotrade Fund, among others have implemented recently.

Evidence demonstrates that economic return to ranchers is greatly improved through the implementation of SPS. In the dry Caribbean region of Colombia, grazing land without fertilizer or irrigation generates an estimated income of US\$579 per hectare per year, but with an annual net loss of US\$200. SPS with trees generates an income of US\$3,839, with US\$1,623 profit; trees on the landscape without SPS practices generate an income of US\$2,935, with US\$954 profit.⁶⁸ The breakeven point for these activities is estimated to be three to four years, which is a reasonable return period. The upfront investment ranges from US\$2,000 to US\$4,000 per hectare, of which a quarter is labor. The internal rate of return estimates for these SPS practices ranges from 32 percent to 37 percent. The employment impact of implementation of SPS is estimated to be one job per every three hectares. However, today it is estimated that only 2 million to 3 million hectares are under SPS in Colombia,⁶⁹ which is only 10 percent of the targeted 28 million hectares. There are compelling financial arguments for converting to SPS in areas where these returns can be achieved.

⁶⁸ Murgueitio et al. (2014). "Sustainable livestock production models: Intensive silvopastoral systems – ISS – in Latin America". CIPAV, Fundación Produce Michoacán: México.

⁶⁹ Interview with CIAT. 21 March 2014.

While there are clearly barriers to bringing many producers into a more commercially oriented business management framework where they take advantage of existing financial products, the sheer scale of financing needed to make an impact on the government's targeted conversion is significant. Consider the estimated cost of conversion of US\$2,500 to US\$4,000 per hectare. For the country to move to SPS on 50 percent the target grazing 28 million hectares by 2019 from the current 10 percent, the cost would be US\$17.5 billion, or annual new funding of US\$4.4 billion. This amount is 18 times the size of the new cattle related loans from FINAGRO. Clearly, even with aggressive growth FINAGRO is not going to be able to support this level of investment. It will require a concerted effort to bring new sources of funds; and given the return potential, focus should be placed on private investments from both domestic and international sources.

5.2.1.3 Value Chain Constraints

Additionally, Colombian cattle ranchers must adapt to a changing climate and to the challenges of recent free-trade agreements that will demand high quality beef and cost-competitive dairy products.

The inability of smallholders to easily access safe and centralized processing facilities limits both market access and the ability of products to be traced or sustainably certified. Since many smallholder cattle producers in Colombia have both limited technical and financial capacity, they are often overlooked by processors focused on changing their own practices to achieve sustainability certifications, rather than assisting those smallholders that supply them. The cost of certifying a large number of smallholders under the international standards TFA companies currently recognize and endorse is also prohibitive to their inclusion in the sustainable supply chain.

The Government of Colombia aims to improve market access under the *Strategic Plan for Colombia Cattle Ranching 2019*, which will apply international environmental standards within the beef and dairy supply chain. Similarly, Colombia aims to promote the National Slaughter System (*Sistema Nacional de Sacrificio*) as an investment opportunity in order to drive the construction and implementation of modern plants with the goal of consolidating the informal slaughter operations that represent 55 percent of the national total.

5.3 BARRIERS WITH BUYERS

5.3.1 Domestic Markets

Public and private development agencies in Colombia should internalize the fact that policies oriented to markets increasingly will be “oriented toward supermarkets.” In Colombia, three or four chains command up to 50 percent or more of the supermarket sector; thus, development programs and policies will need to learn how to deal with just a handful of giant companies. This is a huge challenge and demands an urgent review of ideas and strategies⁷⁰ such as those presented in Section 6.

Organizations such as FEDEGÁN, the most affected by the structural increase in supermarkets' control of retail food, have the responsibility to monitor these price relationships and to influence, in a proactive manner within the milk agro-industrial chain, negotiations with public and private entities and to present the appropriate documentation of the impact of these market practices on the livestock sector in

⁷⁰ ILRI milk sector/market analysis.

Colombia. Otherwise, the new rules of the game could induce a massive exodus of producers in a relatively short period.⁷¹

⁷¹ Ibid.

6.0 PRIORITIZED RECOMMENDATIONS

Taking deforestation out of the cattle supply chains and making beef and dairy environmentally and financially sustainable sectors will require changing production practices as producers shift to intensifying production on existing land for increased productivity. Changing production practices will require upfront costs to farmers and/or lower returns during the period of transition from the old practice(s) to the new. For underperforming industries like Colombia's cattle sector, which is mired in below global average levels of productivity and a high degree of informality, significant outside support may be required to implement sweeping reforms aimed at boosting productivity and improving the environmental soundness of agricultural activities. Technical assistance and/or interim financing from loans or grants are often a prerequisite for catalyzing change that will encourage producers to transition to zero-deforestation production.

Overcoming these barriers will only be achieved over time and will require coordinated technical assistance, participation by supply chain companies, and a significant amount of finance. The main recommendations to address the barriers elaborated below are listed in order of priority:

1. Implement zero-net tracking systems and land-use governance in deforestation hotspots
2. Support full value chain development in high-potential geographies with high-potential producers
3. Repurpose low-potential geographies
4. Build supply chain demand for sustainable beef and dairy
5. Mobilize new financing to support government policy

6.1 IMPLEMENT ZERO-NET TRACKING SYSTEMS AND LAND-USE GOVERNANCE IN DEFORESTATION HOTSPOTS

Though the clearing of forest for pastureland is often identified as the main factor responsible for forest loss,⁷² this process can be regionally complex and involve multiple types of land uses. Municipalities/ departments that have a high risk of deforestation as evaluated by historical trends and other social and political factors should be targeted for activities that aim to ensure that spatially accurate deforestation can be measured and that cattle can be tracked to support zero-deforestation certification.

6.1.1 Implement Municipal-level and Farm-level Certification of Zero Deforestation

There are different approaches to certifying zero-deforestation cattle, and these approaches can be implemented in fairly short order for the high-risk jurisdictions. Some of these certification schemes

⁷² Armenteras, Rodriguez, and Retana, 2013.

include the 1) Sustainable Agriculture Network – Standard for Sustainable Cattle Production Systems; 2) Round Table for Sustainable Beef principles and criteria for global sustainable beef production; and 3) the Verified Carbon Standard’s jurisdictional nested REDD+ rules and requirements, which would help track emission and reductions from REDD+ across a jurisdiction. None of these certifications provide a reliable, simple, and cost-effective way to ensure that beef is truly zero deforestation, but they can be leveraged to create one that can be piloted in the highest deforestation risk municipalities in Colombia.

These efforts should be based on sound data from such municipalities and should leverage other efforts, such as the Rainforest Alliance experience in the municipalities of Doncello, Florencia, and Paujil in the department of Caquetá. In partnership with Fundación Natura, a model was developed for the department and its municipalities that is based on voluntary certification standards that may improve market access for producers, increasing productive capacity, conservation of ecosystems, and the reversal of degradation in soil and forests. In order for this model to be effective, greater coordination is needed across organizations at various scales, as is supportive legislation at different levels. To this end, the model has been supported by Municipal Agreement 12, which provides producers with a tax exemption for ecosystem conservation. Specifically, this agreement sets the stage for the establishment of new conservation areas, as well as necessary monitoring, reporting, and verification activities. However, to continue to scale this model within the department and perhaps to a national scale, improved coordination will continue to be required among municipalities and processors to facilitate tax exemption of participating producers.

6.1.2 Change Land-use Laws and Improve Land Tenure Tracking

In areas where land tenure still can be claimed by achieving property ownership through adverse possession, there is no way to control the cheapest way to “improve” land, which is by placing cattle on it. In areas where deforestation is high, special investments should be made in the recording and formalizing of lands to identify how these actions relate to deforestation and to track future land use. This approach should be taken for high-risk municipalities and to bring them into the formal land use systems. These actions will also improve farmers’ access to finance, since lack of property and/or land tenure rights is a barrier to accessing many sources of finance.

In neighboring Brazil, limited land tenure and related bureaucratic inefficiencies have hindered efforts to cease deforestation caused by cattle ranching. In a study conducted for the Environmental Defense Fund,⁷³ some of the ranchers interviewed waited in excess of 20 years before receiving a title to their land. As is frequently the case in Colombia, a lack of formal tenure frequently and completely inhibits rural cattle producers in Brazil from accessing loans and other financial products needed “to make the costly transition to a deforestation-free operation.”⁷⁴

As one means of combating this issue as of mid-2014, Brazil has recently formally implemented its rural environmental registry (RER), which defines ‘rural property’⁷⁵ and requires all rural property holders to be enrolled in the RER system by May 2015. This effort has important synergistic effects for both forestry regulations and Brazil’s Environmental Regularization Programs (ERPs), which can only be used

⁷³ Stokes, S.; Lowe, M.; and Zoubek, S. (October 2014). Deforestation and the Brazilian Beef Value Chain. Datu Research.

⁷⁴ Butler, R. (October 2014). “Brazil unlikely to sustain gains in reducing deforestation without new incentives for ranchers, says study”. Retrieved from <http://news.mongabay.com/2014/1008-cattle-ranching-amazon-challenges.html>

⁷⁵ Pursuant to the regulation, rural property is defined as a rustic estate with continuous area and is used or intended for farming, livestock breeding, vegetal and/or forest extraction, and agribusiness.

for regularizing permanent conservation areas, legal forest reserves, and restricted use areas. This work takes place through restoration, regeneration, or offsetting measures. In light of these new policy advancements, owners or occupiers of rural properties with pending environmental regularization for their land may only apply to ERPs after enrolling in the RER system.

6.1.3 Summary of Impacts and Challenges

TABLE 4. SUMMARY OF IMPACTS AND CHALLENGES

Scale of Impact	Scale is large if jurisdictional approaches are taken (leveraged with Colombia’s REDD+ program). Supply chain companies demand creditably certified zero-deforestation beef and dairy.
Targeted Groups	All producers who wish to gain access to zero DF supply chain buyers
Complementarity in the Region	Leverages state-level approaches being pursued in Brazil
Development Benefits	If support for certification is provided to small and majority producers groups, this approach could create a formalized link to buyers.
Environmental Impact (including emissions)	Reduces emissions from elimination of deforestation as well as GHG sequestration through increased tree, non-tree and soil biomass
Environmental and Social Risks	Smaller producers excluded/further marginalized from formal market
Implementation and Sustainability Challenges	Certification systems lack clarity or are not efficiently implemented, and supply chain buyers lack commitment, consistency, and transparency.

6.2 SUPPORT FULL VALUE CHAIN DEVELOPMENT IN HIGH-POTENTIAL GEOGRAPHIES WITH HIGH-POTENTIAL PRODUCERS

The various actors within Colombia’s beef and dairy value chains are currently helped or hindered by unequal access to agricultural extension, technology transfer, industry interest groups, and even basic infrastructure. The burden of this inequality falls largely on small producers, who are unable to compete from a quality or sustainability perspective, and who may not even be able to access markets for their products in the first place. As a required first step, analytical work must be carried out in key geographies to identify targets for investment based on region, potential productivity, producer size, impacts on deforestation, and relative strength of the value chain. At present, the Colombian cattle industry as a whole is at risk of diverging into large, export-driven producers and other value chain actors, and the small producers that comprise the majority still have very limited market access. The options for addressing barriers for small producers likely will be very different than those for large producers, and any number and combination of interventions and activities may need to be implemented based on regional geography and other factors. It is unlikely that a one-size-fits-all solution will address all the underlying challenges facing small producers and sustainability in the beef and dairy sectors. The Colombian cattle industry has been further affected by the country’s various trade agreements, which

have resulted in an emphasis on quality and sanitation/admissibility standards among export-oriented producers and other actors at the expense of small beef and dairy producers.

In order for Colombian beef and dairy producers to remain competitive in light of such agreements, there must be two responses with regard to productivity. The first response must result in a reduction of marginal costs in order for Colombian beef to compete with imports, particularly those originating in MERCOSUR countries. At the same time, the second response must focus on increasing productivity (cost per kg or liter produced) on an annual basis. The following recommendations do not represent the total suite of activities needed to achieve these two outcomes. Rather, they help capture the breadth and depth of potential strategies needed to enhance productivity, sustainability, and competitiveness.

6.2.1 Recommendations to Improve the Beef and Dairy Sub-Sector Productive Chains

Beef and dairy productive chains can be enhanced by improving the following:

Pastureland Quality

Availability of pasture—and in some areas the pastureland biophysical potential—is a comparative advantage for Colombia. More programs are needed that aim to establish improved pastures with trees and silvopastoral systems focused on increased quality forage. Pasture improvement is a fundamental aspect that will substantially alter rates of productivity and significantly reduce production costs. Therefore, there is a need for technical assistance and financing in high-potential cattle-producing regions focused on soil preparation, improved pastures, and silvopastoral systems. The Colombian dairy sub-sector will need to support the creation of public policies incentivizing development of lands with good pastures in order to promote improved production, quality, and efficiency through the use of rapidly growing pastures with high protein content in ways that reduce deforestation. Transitioning to improved pasture management requires a high up-front cost, and credit for agricultural projects in Colombia is poor, with high annualized interest rates of 10-12 percent.⁷⁶ There needs to be a continued focus on improving access and efficiency for smallholders seeking finance.

Extension of new technology to small and medium producers in Colombia is essential. Technology is needed that aims to improve both per-hectare and per-animal productivity, alongside a cultural shift among producers. Models must favor production that is environmentally sustainable, profitable, and socially responsible. Strong knowledge management practices are required for purposes of technological advancement and adoption.

To catalyze behavior change among smallholders and to change attitudes toward sustainable practices, farmer field days and other evidence-based knowledge sharing opportunities could help overcome commonly held perceptions of and assumptions about sustainable management systems.

Breeding/Genetics

In the short term, there should be an emphasis on the implementation of a National Breeding Program, where appropriate breeds are identified based on geography and types of production systems. This approach requires state-supported finance for a national evaluation and analysis of regional data on production records and quality of breeds relative to the meat and dairy produced.

⁷⁶ La Republica. (November 2013). “Migrar hacia un modelo exportador de leche depende de la reduccion de costs de produccion.”

Health and Sanitation

Illnesses are a common limiting factor for productivity in cattle production systems in Colombia. There is a need for studies to determine the prevalence and incidence of diseases, as well as risk factors and prevention strategies. Health admissibility is essential to being able to market products for export.

Human Capital

The cattle sector generates 600,000 direct jobs, primarily for households with low income and little job training. The Ministry of Education and SENA, the national skills training institution, should partner to facilitate skills training. Additionally, technical institutions and institutions of higher education increasingly should link. Possible opportunities could include a “rural social year” focused on technical fieldwork in communities in the production areas.

Industry Associations

Since the livestock sector largely comprises small and medium producers, these producers are in a vulnerable position from a product marketing perspective. Strategies and policies should encourage partnerships between producers of meat and/or dairy to strengthen their bargaining power against big industry while channeling services from outreach programs. Small producers are also not as strongly represented by industry groups as larger producers may be. Industry-wide associations and collectives include ANDI’s Colombian Food Chamber, ASOLECHE, the national milk producers association, and the Association of Independent Producers, which is an association of small- and medium-sized producers.

Rural infrastructure

Tertiary roads in Colombia are highly neglected, and more than 225,000 km of road are considered to be in very poor condition. Climate change has further exacerbated poor infrastructure due to extended winter conditions. Colombia’s small primary producers are the most affected, with high costs associated with accessing needed infrastructure and low profitability – if livestock production, whether for beef or dairy, is profitable at all. Many producers are unable to earn anything for their products due to their inability to get products to transportation routes for collection.

6.2.2 Summary of Impacts and Challenges

TABLE 5. SUMMARY OF IMPACTS AND CHANGES

Scale of Impact	Large, across the entire value chain
Targeted Groups	Value chain actors at all levels, particularly those that will benefit from technology transfer and best practices
Complementarity in the Region	Value chain innovations will help put the Colombian cattle sub-sector on equal footing with its neighbors, particularly Brazil, Argentina, Uruguay, and Paraguay
Development Benefits	Improved rural infrastructure has wide-reaching benefits beyond actors in the cattle industry that will improve market access for a variety of goods and services in rural areas. Cooperatives and other forms of association further enhance market access and smallholder bargaining power.

Environmental Impact (including emissions)	Pasture intensification will help reduce emissions by restoring trees on the landscape and the suite of best practices associated with ISPS.
Environmental and Social Risks	Capital costs associated with wide-reaching infrastructure needs may be challenging to finance and manage.
Implementation and Sustainability Challenges	Financing remains the biggest barrier to implementing the type of broad reforms needed across the value chain to bring the Colombian cattle sub-sector to the level of its regional and international competitors.

6.3 REPURPOSE LOW-POTENTIAL GEOGRAPHIES

As part of a multi-faceted effort to address productivity and sustainability challenges within the beef and dairy sectors, the analysis recommended in Section 6.2 should be used to recalibrate the regional foci for investment and related interventions. At present, the country-wide scale of Colombia’s cattle sector, particularly the dispersed nature of its small producers, makes a broad, integrated approach challenging if not impossible. Rather, consideration should be given to potential alternative livelihood activities for producers in those regions where marginal costs are too high and where the cost of implementing sustainable land management and intensification may be too great. Investment in productivity and sustainability should be aimed at those producers in geographies where market access can readily be improved, where deforestation can be reduced, and where productivity gains will be greatest.

6.3.1 Summary of Impacts and Challenges

TABLE 6. SUMMARY OF IMPACTS AND CHALLENGES

Scale of Impact	Country-wide; this recommendation can take advantage of Colombia’s national strategy to bring more land under production of non-cattle agricultural commodities.
Targeted Groups	Primarily small-scale producers
Complementarity in the Region	This recommendation may allow smallholders that are unable to fully capitalize on their beef and dairy products due to regional and international competition and a lack of market access to become more competitive by switching production to agricultural crops and other activities better suited to the Colombian context.
Development Benefits	Diversifying income streams will make communities and households more resilient to the impacts of climate change, future unrest, and regional and international market factors.
Environmental Impact (including emissions)	Converting to other livelihood activities, including other types of agricultural production, allows for the potential implementation of a variety of restoration activities, including agroforestry and non-timber forest products.
Environmental and Social Risks	In cases like Colombia, there is always a small possibility that producers will engage in more lucrative activities that are

	environmentally or socially harmful; however, the overall environmental and social risks are low.
Implementation and Sustainability Challenges	Implementing alternative livelihood activities will require more detailed local and departmental knowledge to best match activities to the environment and community practices. Costs to convert to other practices and activities may also be high, and financing sources will need to be identified.

6.4 BUILD SUPPLY CHAIN DEMAND FOR SUSTAINABLE BEEF AND DAIRY

Supply chain companies interviewed for this study felt there was no consumer demand for sustainable beef and dairy products from Colombia’s domestic market. They believed that building awareness would be extremely challenging for corporations to take on. Donor-supported efforts could be put in place to invest in building consumer awareness of sustainability and providing a credible and consistent set of labeling for end products. This investment would differentiate products and companies as well as start to create demand for producers who meet these requirements. A sustainable cattle labeling and marketing campaign, coupled with the support to meet these certifications—with a specific focus on producers that have greatest chance of meeting the requirements—would start to build demand for sustainable beef and dairy. However, for these investments the supply chain companies in turn would need to support consumer labeling and be prepared to provide long-term purchase agreements to help suppliers meet the certification schemes.

Supply chain companies felt there was little support for approaching producers on matters of sustainability and zero deforestation within their value chains in Colombia. Each company had some ongoing initiative—some catalyzed by company membership in the TFA 2020—but they didn’t feel there was an organized effort that linked to other sources of finance. They also felt that their own financial resources were not enough to implement the types of changes needed to generate real reform in the production of beef and dairy. Strong and unified leadership in Colombia among the largest supply chain companies—with support for linking to donor funding activities and public private partnership resources—is critical.

6.4.1 Summary of Impacts and Challenges

TABLE 7. SUMMARY OF IMPACTS AND CHALLENGES

Scale of Impact	Modest; in current market that includes primarily domestic consumers who lack consumer-driven demand, this work can only be driven by companies' good will
Targeted Groups	Larger domestic companies and international companies in Colombia, with links to TFA 2020 and/or other sustainability commitments
Complementarity in the Region	There are opportunities to promote commitments with Colombian supply chain buyers in the other major beef and dairy countries in South America, including Brazil, Argentina, Uruguay, and Paraguay.
Development Benefits	If supply chain buyers provide long-term purchase contracts for zero-deforestation producers, the producers will be more bankable and able to invest in productivity improvements and building non-livestock agricultural income streams.
Environmental Impact (including emissions)	Without commitments (investments in value chain infrastructure, clear/transparent certification requirements, and long-term purchase contracts) from supply chain buyers, emissions from deforestation cannot be reduced.
Environmental and Social Risks	Supply chain buyers may marginalize small producers through purchasing practices and certification requirements.
Implementation and Sustainability Challenges	Companies are not committed; or, if they are committed, they use different metrics for zero deforestation and are not well prepared to change suppliers for lack of compliance.

6.5 MOBILIZE NEW FINANCING TO SUPPORT GOVERNMENT POLICY

The Colombian government targets a reduction in hectares of grazing land down to 28 million with a 17-million head increase by 2019, which equates to increasing average stocking rates from 0.6 cows per hectare to 1.4. This policy is clearly designed to affect the practices and economics of cattle raising, but it is also critical to ensuring that Colombia is able to grow non-livestock agricultural production in already deforested areas. Focusing on the financing needed to meet these policy objectives raises some interesting questions. It is estimated to cost between US\$2,500 and US\$4,000 per hectare to increase stocking rates from 0.6 to 1.4 cattle per ha. Financing these producer-facing changes only (i.e., not the rural and supply chain infrastructure) on half of the targeted hectares (~10,250,000) would cost US\$25 billion, or US\$6.4 billion annually until 2019. This amount of financing is significant, particularly when compared to the estimated market value of the beef and dairy sector in Colombia, which is roughly estimated to be US\$5 billion – 7 billion annually. This issue implies that, unless lower-cost solutions to promoting land-use change can be identified, then the cost of implementing the policy would require investing 100 percent of the sectors' market value each year for four years.

The US\$5 billion per year, or any meaningful fraction thereof, is unlikely to come solely from the Colombian government or international donors. FINAGRO has roughly US\$225 million in new loans available each year, and possibly US\$1 billion could come from targeted *Sistema General de Regalías*.

Domestic banks, led by *Banco Agrario de Colombia*, could possibly provide an additional US\$500 million to US\$1 billion, but there still would be a significant gap.

To maximize the impact of FINAGRO on the cattle sector, their financing products would need to be refined to reward those who specifically produce the desired results, and FINAGRO would need to have access to a far greater pool of capital. Domestic and international investors could be accessed to provide the additional capital. The Colombian pension fund manages US\$60 billion in assets and provides a potential source of funds. Colombia's private equity industry is expanding and becoming more sophisticated and able to attract international investments due to investor protection and regulations being consistent with international standards. A small but first time dedicated fund, NatureVest, is raising US\$100 million to invest in sustainable cattle. There is some evidence in the region that investments can be secured to support more sustainable production. The International Finance Corporation provided \$80 million in finance to Minerva, Brazil's second-largest beef exporter, to help strengthen its environmental and social standards and enhance the traceability of its supply chain through the implementation of an action plan to address the environmental impacts of its regional expansion in Brazil and the Southern Cone⁷⁷.

A greater effort to attract international investors should be made for the beef industry in Colombia. However, the publically available investment documentation prepared by Proexport (the government's Agency for Investment Development) and FEDEGAN (does not make a compelling case for investing in the Colombian cattle sector. Proexport Colombia has been considered successful in other sectors and could be a valuable resource to support the development of new funding sources for the cattle sector.

Based on studies that define and promote SPS, the potential for financial returns should support private investments⁷⁸. Small producers are less likely to be able to access this finance, as more than half of livestock producing farms do not currently meet the minimum qualifications for financing required by FINAGRO. Private investors' requirements will be at least as strict. If funding can be secured for the sector, there still would need to be specialized technical assistance to help producers of all sizes access financial programs supporting SPS and reduced deforestation.

Mobilizing capital to meet current policy objectives is hindered by: 1) costs of changing practice, which may not be attractive to producers and may cost more to implement than producers earn per hectare; 2) the challenges associated with identifying and accessing new sources of funding; and 3) a lack of access to adequate financing, particularly by small producers. It is unlikely that funding will be adequate to achieve productivity gains at the scale they are currently projected, even with new sources of private funding. Streamlining overlapping policy objectives may help reduce these annual costs, but revisiting expected targets and realigning them with realistic financing scenarios will also be important to maximize impact from available resources.

⁷⁷ International Finance Corporation. (n.d.) "IFC Supports Minerva's Sustainable Expansion in South America with BRL 185 million Investment, including Equity". Retrieved from <http://ifcext.ifc.org/IFCExt/pressroom/IFCPressRoom.nsf/0/9AD7AED1ED28A3F885257BE20075256E?OpenDocument>, Accessed on 5 January 2014.

⁷⁸ Murgueitio et al., 2014.

6.5.1 Summary of Impacts and Challenges

TABLE 8. SUMMARY OF IMPACTS AND CHALLENGES

Scale of Impact	Current government policy objectives will only be achieved if significant funding is raised, which is not likely. Small-scale finance may be used to focus only on deforestation hotspots.
Targeted Groups	All producers where implementation of SPS can promote competitive levels of productivity linked to effective supply chains
Complementarity in the Region	Brazil has a developed agriculture policy and has numerous incentives and financing programs to encourage growth and sustainability in cattle.
Development Benefits	If provided to smaller and marginalized producers as well as financing investment, access to finance can improve livelihoods.
Environmental Impact (including emissions)	Reduces emissions by eliminating deforestation in the supply chain as well as increases GHG sequestration through tree, non-tree, and soil biomass
Environmental and Social Risks	Finance only reaches the larger producers, who are offered terms that are not sustainable to the borrow or lender
Implementation and Sustainability Challenges	The magnitude of financing needed is high, and the uncertainties around investment returns are great.

ANNEX I. ADDITIONAL INFORMATION ON CORPORATE SUSTAINABILITY INITIATIVES

A.1 NESTLE

Nestle reports the following productivity gains due to its activities in the dairy supply chain:

1. Milk production per cow has increased from 4.8 l/day to 6.2 l/day.
2. Milk production per hectare increased from 1.8 l to 7 l.
3. Average animals per hectare has increased from .6 cows to 1 cow.
4. Average monthly farmer income has increased by 47 percent.
5. Overall, production has increased by 147 percent since the start of the project.

Overall, average milk production is up by 38 percent, and nearly 96 acres are now under improved management to help prevent erosion. Local employment increased to an average of two jobs per farm. Through the Dairy Development Plan, Nestle had invested US\$140,000 as of mid-2012, primarily in the form of technical support and the provision of credit/loans to small farmers. In addition to the Dairy Development Plan, Nestle distributes US\$5 million monthly to 4,000 local dairy farmers and has helped employ an additional 10,000 people in the local dairy supply chain.⁷⁹

A.2 GRUPO EXITO

In the interim, Grupo Exito is investigating its beef sourcing areas with its buyers to explore avenues for silvopastoral systems and adoption of best practices in beef production, particularly slaughter, and to gauge producer interest in participating in a sustainable production platform. Thus far, producers have not been especially interested in sustainability.

Grupo Exito has received international funding from the Government of the Netherlands and the Clinton Foundation for sustainability initiatives related to its palm and coffee value chains. The company is also working with the Ministry of Commerce and the Ministry of Agriculture on responsible business programs, including value chains for meat; however, this work is in the very preliminary stages. Interviews with Grupo Exito in Colombia emphasized the need for support from international funding sources to promote sustainable production, particularly as it concerns beef, as meat in general has not been a priority in Colombia despite a strong culture of meat consumption.

⁷⁹ Nestle. (n.d.) "Silvopasture Dairy Farming". Retrieved from <http://www.nestle.com/csv/case-studies/allcasestudies/pages/silvopasture-dairy-farming-colombia.aspx>

Grupo Exito sources its dairy from Alpina and Colanta, upon whom the company relies to engage in sustainable practices, largely through RedES-CAR (*Red de Empresas Sostenibles/Sustainable Enterprises Network*). RedES-CAR is as a partnership between the public sector, Universidad de los Andes and other universities, the private sector, and Colombia's *corporaciones autonomas regionales (CARs)*. Its objective is to generate productive transformation in supply chains formed by large companies and their suppliers in order to improve both competitiveness and environmental performance. Both Grupo Exito and Alpina were among four "anchor" companies brought together with 38 small, medium, and large suppliers in Stage One.

A.3 ALPINA

Alpina's primary sustainability objective is to implement sustainable livestock management strategies and be able to guarantee a sustainable dairy supply for the foreseeable future. The company is still in the process of determining what best practices should look like and how they would be implemented, but goals include increasing productivity per hectare, achieving greater efficiency with fewer animals, and preventing deforestation and other negative environmental impacts caused by livestock-related activities.

Through the *Mapa Social* initiative, supported by the Government of Colombia and Fundacion Alpina, Alpina is participating in an expansion program (Inclusive Businesses: Small Dairy Producers in the Cauca) with its international cooperative organizations. The program focuses on the southern dairy-producing regions of the departments of Cauca⁸⁰ and Narino where there is a high concentration of small dairy producers. The program has targeted 189 indigenous, Afro-Colombian, and indigent small producers since 2009. A US\$9.3 million endowment fund associated with the program was established in 2013. The program achieves an integrated system of milk supply and high standards of productivity and quality through an inclusive model in which households receive technical assistance as well as a guaranteed sales volume and price for production. The program has three primary objectives:

1. For Alpina to establish a presence in a new milk producing region and to promote new and better forms of production and work organization
2. To ensure supply conditions (quality, cost, etc.) necessary to achieve expected growth
3. To introduce an inclusive business model that improves economic welfare and household food security in the producing region

Producers linked with Alpina receive support in four stages:

1. Product marketing
2. Administrative evaluation and analysis on a per-producer basis regarding quality and price of the product being delivered
3. A small and/or efficient transport area that guarantees quality and prevents spoilage
4. Bi-weekly payment disbursements

⁸⁰ In Cauca, there are two programs: 1) A program with Oxfam aimed at the social and financial sustainability of smallholder systems in four municipalities. Phase I began in 2007; Phase II began in 2013. 2) A program with the Government of Cauca focused on creating a dairy conglomerate in 14 municipalities.

The program has demonstrated success in five areas:

1. Creation of a secure market for products with a favorable price and payment schedule
2. Development of innovation and differentiation schemes
3. Provision of technical advisory support
4. Better feedback for producers through periodic reporting
5. Incorporation of intermediaries in the value chain

Colanta does not offer a price premium for dairy products that may be differentiated in other ways, and there are no programmatic elements aimed at improving dairy production systems among producers. Colanta's ongoing sustainability initiatives instead focus on the water challenges affecting its producers. The company is currently in negotiations to be part of foundation called *Cuenca Verde* ("Green Valley"), the Medellin water fund that is part of the Latin American Water Funds Partnership. *Cuenca Verde* is a public-private partnership⁸¹ to conserve water and improve water resource management through watershed conservation and science-sectoral collaboration. The project commenced in October 2013 and expects to benefit approximately 2,750,000 people in Medellin and the surrounding watersheds, which contain two significant reservoirs – the *Rio Grande II* and *Fe* reservoirs, which are considered critical to the water supply of the Aburra Valley.

The objectives of this program follow:

1. Recovery and restoration of ecosystems
2. Application of sustainable production practices
3. Conservation and management of biodiversity resources
4. Improved water resources management
5. Education, training and communications, monitoring, and applied research

Beyond these initiatives, Colanta does not have any targeted programs for sustainable dairy production, though the company has signaled a "medium-term" plan for sourcing sustainable beef and dairy, as well as potential for tiered pricing and further product differentiation. However, further details were not available at the time of writing.

⁸¹ Partnering organizations include the Municipality of Medellin; Grupo EPM, a Colombian public utility; CORNARE (regional autonomous corporation); Grupo Nutresa, a food-processing conglomerate; Postobon, one of the largest Colombian beverage companies; the Metropolitan Area of the Aburra Valley; Coca-Cola; and the Latin America Water Funds Partnership.

ANNEX II. BEEF AND DAIRY VALUE CHAINS

The milk/dairy supply chain in Colombia comprises the following actors/links:

1. Suppliers (farm inputs, food, sanitation, biotechnology related to breeding, agricultural equipment)
2. Producers (production units)
3. Gathering/aggregation
4. Processors (industrial)
5. Traders/retailers

Colombia's dairy sub-sector is also affected by the division of production based on geography into specialized dairy and dual-purpose production systems. Specialized dairy is largely found in the highland tropics, and animals tend to be dedicated at least 80 percent to milk production. Dual-purpose systems can be found in the lowland tropics, which are the most profitable given the climate⁸² and are generally used 50 percent for milk and dairy and 50 percent beef production. The total milk production inventory includes nearly 4.4 million females over a two-year period in dual purpose systems, and nearly 350,000 in specialized dairy.⁸³

In Colombia, 44.3 percent of farms—or more than 100,000—have fewer than 10 animals. Small farms are primarily specialized dairy producers, especially in the Cali basin where there are many subsistence smallholders. Approximately 110,000 farms, or 22.3 percent, have 11 to 25 animals, and roughly 72,000 farms (14.6 percent) have 26 to 50 animals. In total, there are nearly 400,000 farms with 50 or fewer animals. Specialized breeds predominate in the highland tropics; 72 percent of cattle used are *Bos indicus*.

Competitiveness of a dairy enterprise in the five regions⁸⁴ studied by the International Livestock Research Institute (ILRI) is directly correlated with herd size; smaller herds produce milk at a higher cost. Competitiveness may also be strongly correlated with productivity; however, in this instance competitiveness is not correlated with profitability.⁸⁵ This finding confirms the presence of economies of scale for dairy producers in the five regions that produce more than 80 percent of Colombia's milk.

⁸² Dual-purpose systems raise cattle for both beef and dairy.

⁸³ FEDEGAN, 2006.

⁸⁴ The milk-producing regions that formed the basis for this study were divided as follows: a) 145 farms in the lowlands of the Savannas piedmont (states of Arauca, Casanare, and Meta); b) 116 in the lowlands of the Caribbean region (Atlántico, Guajira, Magdalena, César, Bolívar, and Córdoba states); c) 105 in the midland of the coffee growing area (Quindío, Valle, Caldas, and Risaralda); d) 97 in the mountain highlands of Antioquia; and e) 82 farms in the Highlands of the Savanna Cundiboyacense (states of Cundinamarca and Boyacá).

⁸⁵ ILRI. (n.d.) Evolution of Milk Production Systems in the tropics of Latin America and its interrelationship with markets: An analysis of the Colombian case.

Adoption of improved pasture management practices resulted in higher profits and higher productivity in all five regions.⁸⁶ Investment in multiple paddocks for rotational grazing of improved pastures in order to increase quantity and quality of biomass also generated higher productivity in all five regions. Profits also increased through this approach in all but the Caribbean region.

Jobs provided by the dairy subsector are equally as critical to smallholders as the jobs created by the beef subsector, and dairy production in Colombia is more labor intensive. Specialized dairy systems create 7.9 jobs per 100 head of cattle, while dual-purpose systems generate 5.5 jobs per 100 head. In total, milk production is responsible for the direct creation of more than 600,000 jobs. Producers are represented by FEDEGÁN, which is composed of regional committees of dairy and beef producers, as well as Asociación Nacional de Productores de Leche (ANALAC,) which represents producers in zones that specialize in milk production.

Small producers are disadvantaged in terms of productivity and profitability. Costs incurred by traders in order to market and sell dairy products to supermarkets and other large buyers like Nestle are generally passed on to producers; small producers that are already producing milk at a higher cost are not able to absorb these additional expenses. Costs that are potentially passed on to the producer were determined through informal conversations with supermarket and milk processing plant managers in Cali, Colombia.⁸⁷ Retailers were found to request the following from the milk processors from whom they source their milk:

- First two deliveries of dairy are free
- All advertising and/or marketing expenses are borne by the processor
- Buyer receives a discount in perpetuity that is 5 percent less than the price given to “small” neighborhood shops and markets
- Processor must lease space to sell its products at a rate of US\$400/lineal meter.
- Processor must pay an annual quota equivalent to 1.8 percent of the estimated annual sales at a given supermarket⁸⁸

Small producers are further disadvantaged due to disparities in technology access; high transportation and milk-collection costs have resulted in the promotion of milk coolers among medium and large producers by milk plants. Small producers are also not as strongly represented by industry groups as larger producers may be. Industry-wide associations and collectives include the National Association of Industrialists (ANDI's) Colombian Food Chamber, ASOLECHE, the national milk producers association, and the Association of Independent Producers, which is an association of small- and medium-sized producers.

The gathering and aggregation stage in the chain largely only applies to medium and large producers with more advanced degrees of technology adoption, though some smallholders may have access to this stage if they belong to a producers' cooperative. There are essentially three means of collection and aggregation:

⁸⁶ Ibid.

⁸⁷ Ibid.

⁸⁸ Ibid.

- Cooperative collection centers
- Formal collection centers
- Informal milk gathering

The processing company owns and operates formal collection centers. In total, there are 477 milk collectors in Colombia. 64.6 percent of the milk collected in the country goes to just nine processors. Formal collection accounts for approximately 45 percent of total annual milk production. Informal gathering takes milk directly from producers to commercialize and distribute directly to consumers without sanitizing.

The processing phase, which is dominated by just nine producers, creates asymmetries in the concentration of power within the supply chain, and thus in the allocation of negotiating power. The five largest processors take in more than 60 percent of the milk collected; the top 25, almost 80 percent. The top five processors are also characterized by a high level of technological advancement and a strong presence within Colombian industry cooperatives and associations. This includes key stakeholder positions with national and international private companies. Processing of raw milk depends on hygienic⁸⁹ and compositional⁹⁰ quality.

Processors are represented through a variety of associations, cooperatives, and other organizations. FEDECOLECHE serves as an umbrella organization for other dairy collectives, such as COLANTA, COOLECHERA, and COLACTEOS. In 2008, three areas of Colombia's dairy processing industry employed the most employees. These were pasteurized milk (8,296 employees); sour and fermented milk (6,859 employees); and skimmed milk butter (6,519 employees).⁹¹

Traders in the next part of the chain typically rely on three channels:

1. "Zero" level, or direct: processor to end consumer
2. One level or short-indirect: processor to retailer to consumer
3. Multilevel or long-indirect: processor to wholesaler to retailer to consumer

⁸⁹ Content of bacteria and pathogens in milk; presence of residual drugs/medications

⁹⁰ Content of non-fat solids and milk fat; primarily determined by genetic and nutritional factors

⁹¹ JMC International. (2008). *Dairy Industry in Colombia*.

ANNEX III. DETAILED ASSESSMENT OF FINAGRO FINANCING

Created in 1991, FINAGRO is a public-private sector second-tier financial intermediary (STFI) established to correct the market failure of providing low-cost and affordable financial products to Colombia's agricultural sector. FINAGRO's equity holders include MARD (*Ministerio de Agricultura y Desarrollo Rural* in Spanish) with 65.3 percent; the Colombian Agrarian Bank (CAB) (*Banco Agrario de Colombia*) with 12.9 percent; Davivienda with 12.7 percent; BBVA with 9.1 percent; and the FINAGRO employee stock fund, FONDEFIN, with 0.001 percent.⁹² Today, FINAGRO operates under administrative autonomy and has grown into one of the largest, if not the largest, provider of agricultural finance in the country.

Currently, FINAGRO has five principal product lines, including: (1) Development Finance (*Financiamiento de fomento*); (2) Access to Finance (*Acceso al financiamiento*); (3) Agricultural Risk Management (*Gestión de riesgos agropecuarios*); (4) Rural Investment Promotion (*Promoción a la inversión rural*); and (5) Productive and Social Strengthening (*Fortalecimiento Productivo y Social*).⁹³ Of these product lines, the most significant capital mobilization mechanisms are found within the Development Finance, Access to Finance, and Rural Investment Promotion segments.

C.1 DESCRIPTION

As a part of its Development Finance product line, FINAGRO provides loans to small, medium, and large rural agricultural producers through a variety of credit offerings grouped in three product categories: i) Working Capital (*Capital de trabajo*); (2) Capital Investment (*Inversión*); and (3) Balance Sheet Normalization (*Normalización de cartera*).⁹⁴ In regard to products applicable to Colombia's cattle sector, FINAGRO has traditionally used various credit lines within their Working Capital and Investment product categories.

As a part of the Working Capital product category, FINAGRO offers three different credit lines for cattle sector financing: i) Agricultural Production Continuity Credit (*Sostenimiento de la producción agropecuaria*), offered to producers only; ii) Primary Transformation and Commercialization of Agricultural Goods Credit (*Transformación primaria y comercialización de bienes de origen agropecuario*)

⁹² FINAGRO. (2014). "Informe de Gestión Sostenible 2013. Annual Report." Bogotá: Ministerio de Agricultura y Desarrollo Rural, 2014; p. 20.

⁹³ Ibid; p. 28.

⁹⁴ FINAGRO. (2014). "Productos y servicios: Crédito." Retrieved from <https://www.finagro.com.co/productos-y-servicios/credito>. Accessed 23 July 2014.

offered to both input providers and producers; and iii) Agricultural Production Support Service Credit (*Servicios de apoyo a la producción agropecuaria*) offered to input providers only.⁹⁵

In regard to FINAGRO's Investment product category, FINAGRO historically offered 10 different types of products to catalyze financing to the cattle sector: (1) Animal Purchase Credit (*Compra de animales y retención de vientres*); (2) Machinery and Equipment Purchase or Repair Credit (*Adquisición de maquinaria y equipo, y reparación de maquinaria*); (3) Land Adaptation Credit (*Adecuación de tierras*); (4) Agricultural Production Infrastructure Credit (*Infraestructura para la producción agropecuaria*); (5) Primary Transformation and Commercialization of Agricultural Goods Infrastructure Credit (*Infraestructura y equipos para transformación primaria y comercialización*); (6) Agricultural Production Support Service Infrastructure Credit (*Infraestructura de servicios de apoyo a la producción*); (7) Land Acquisition Credit (*Compra de tierras*); (8) Rural Housing Credit (*Vivienda rural*); (9) Enterprise Creation, Capitalization, and/or Purchase Credit (*Capitalización, compra, y creación de empresas*); and (10) Research and Development Credit (*Investigación*).⁹⁶

C.2 ELIGIBILITY

With regard to potential borrowers, any individual producer or enterprise operating in Colombia's agricultural sector may access FINAGRO's credit lines.⁹⁷ For purposes of FINAGRO's lending conditions and risk management processes, FINAGRO classifies agricultural producers in six separate borrower categories: i) Rural Low-Income Female Producer (asset value of up to US\$31,912); ii) Small-Size Producer (asset value up to US\$45,588); iii) Medium-Size Producer (asset value between US\$45,589 and US\$1,571,995); iv) Large-Size Producer (asset value greater than US\$1,571,996); v) Micro-Enterprise Producers (asset value up to US\$157,514); and vi) Micro, Small, and Medium Enterprise Producers (asset value up to US\$9,431,973).⁹⁸ Documentation requirements vary by borrower and the FTFI providing the loan and they require demonstration that the project is technically, financially, and environmentally viable. This evidence includes, but is not limited to, financial projections and budgets, land and/or property titles, and equipment machinery and/or equipment cost estimates.

C.3 STRUCTURE

FINAGRO is an STFI that provides financing to FTFIs that distribute and administer such products to end-client agricultural producers. FINAGRO's credit portfolio is financed through four different avenues: i) FINAGRO's Agricultural Development Bonds (ADB) (*Títulos de Desarrollo Agropecuario, or TDA*), which every financial institution in Colombia is required to purchase; ii) FTFI proprietary loans that may be deducted from the FTFIs' annual ADB purchase; iii) FTFI proprietary loans that may not be deducted from the FTFIs' annual ADB purchase; and iv) FINAGRO's capital.⁹⁹ As a part of its credit portfolio,

⁹⁵ FINAGRO. (2014). "Información Sectorial: Ganadería." Productos Servicios e Incentivos - FINAGRO. Retrieved from <https://www.finagro.com.co/productos-y-servicios/informaci%C3%B3n-sectorial>. Accessed 20 June 2014.

⁹⁶ Ibid.

⁹⁷ FINAGRO. (2014). "Manual de Servicios." Capítulo I: Crédito Agropecuario y Rural. Retrieved from <https://www.finagro.com.co/normas/manual-de-servicio>. p.5. Accessed 23 July 2014

⁹⁸ FINAGRO. (2014). "Manual de Servicios." Capítulo I: Anexo III - Cuadros I.1 al I.5. Retrieved from <https://www.finagro.com.co/normas/manual-de-servicios>. Accessed 30 July 2014

⁹⁹ Ministerio de Agricultura y Desarrollo Rural. (2014). Informe de Gestión Sostenible 2013. Annual Report. Bogotá: p. 46.

FINAGRO offers three different types of loan modalities to its FTFI partners: i) Re-Discount (*Redescuento*); ii) Replacement (*Sustitutiva*); and iii) Agricultural (*Agropecuaria*).¹⁰⁰

In terms of the FTFIs that distribute FINAGRO's credit products, CAB is FINAGRO's largest FTFI partner and distributor. In 2013, CAB distributed 49 percent of FINAGRO's loan product (measured by aggregate loan value). Bancolombia followed CAB with 13 percent, BBVA with 9 percent, and Davivienda with 8 percent.¹⁰¹

C.4 AVAILABLE FUNDING

In 2013, FINAGRO's total loan portfolio grew 10 percent from 2012 levels to COP \$12.6 trillion¹⁰² (US\$6.74 billion), the largest value in the organizations' history.¹⁰³ In regard to producer size, 31 percent of the value of FINAGRO's total credit portfolio in 2013 can be attributed to small producers, while 34 percent was attributed to medium producers, and 35 percent to larger-size producers.¹⁰⁴ Colombia's cattle sector was the largest participant with 34.7 percent of portfolio share and is followed by coffee (11.5 percent); palm oil (9.8 percent); sugar cane (7 percent); and rice (4.2 percent).¹⁰⁵ In terms of product line, 2013 saw a total loan portfolio breakdown in Working Capital of 15 percent, Capital Investment 76 percent, and Balance Sheet Normalization of 9 percent.¹⁰⁶ With respect to producer size, COP \$1.8 billion (US\$962 million) was disbursed to small producers, while another \$1.8 billion (US\$962 million) was disbursed to medium-sized producers, and COP \$3.4 billion (US\$1.82 billion) was disbursed to large-size producers.¹⁰⁷

¹⁰⁰ Ibid.

¹⁰¹ Ministerio de Agricultura y Desarrollo Rural, 2014.

¹⁰² In Spanish billion means millions of millions or 10¹². For this report all COP figures are converted to the use of trillion.

¹⁰³ FINAGRO. (2014). Informe de Gestión Sostenible 2013. Annual Report. Bogotá: Ministerio de Agricultura y Desarrollo Rural. p. 40.

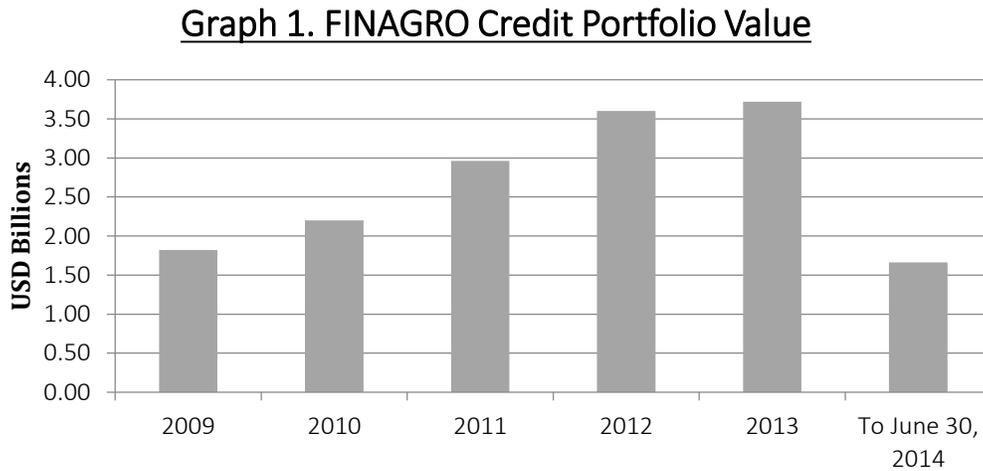
¹⁰⁴ Ibid; p.41.

¹⁰⁵ Ibid.

¹⁰⁶ Ibid.

¹⁰⁷ Ibid.

FIGURE I. FINAGRO CREDIT PORTFOLIO VALUE



Source: FINAGRO. *Informes Anuales 2009 – 2013* and “*Estadísticas*” 2009 – 2014. *Otorgados por Productor*.

C.5 SCALING POTENTIAL

FINAGRO’s loan products represent the bank’s largest product line. As such, they have a high scaling potential. FINAGRO aims to grow its loan portfolio between 5 percent and 10 percent annually so as to formalize a rather informal Colombian agricultural sector.¹⁰⁸ In terms of specific credit allocations to the cattle sector, FINAGRO is a demand-driven financial intermediary operating in a well-diversified national agricultural sector. Therefore, FINAGRO does not establish portfolio targets or limits for certain sectors or geographies, as credit demand has been quite diversified.

C.6 AGRICULTURAL GUARANTEE FUND

C.6.1 Description

FINAGRO also catalyzes financing to the Colombian agricultural sector through its Agricultural Guaranty Fund (AGF) (*Fondo Agropecuario de Garantías*), which has a primary objective of ensuring the provision of credit, through FTFIs, to end-client agricultural producers. In the event that potential borrowers do not have sufficient collateral (according to the FTFI’s credit procedures), the respective FTFI may request from FINAGRO a guaranty that covers, depending on borrower characteristics, a pre-established percentage of the respective credit. As a result of receiving a FINAGRO guaranty, the FTFI may consummate the credit transaction with a limited borrower collateral package, as it would have the reassurance that FINAGRO would pay out the defined percentage of the debt obligations in the event of default.

¹⁰⁸ Ortegón, 2014.

C.6.2 Eligibility

To be considered for a FINAGRO credit guaranty, the FTFI must be issuing the credit under the auspices of FINAGRO's three credit modalities (Re-Discount, Replacement, or Agricultural) to individual or enterprise borrowers classified as a: (1) Rural Low-Income Female Producer; (2) Small-Size Producer; (3) Medium-Size Producer; or (4) Large-Size Producer.¹⁰⁹

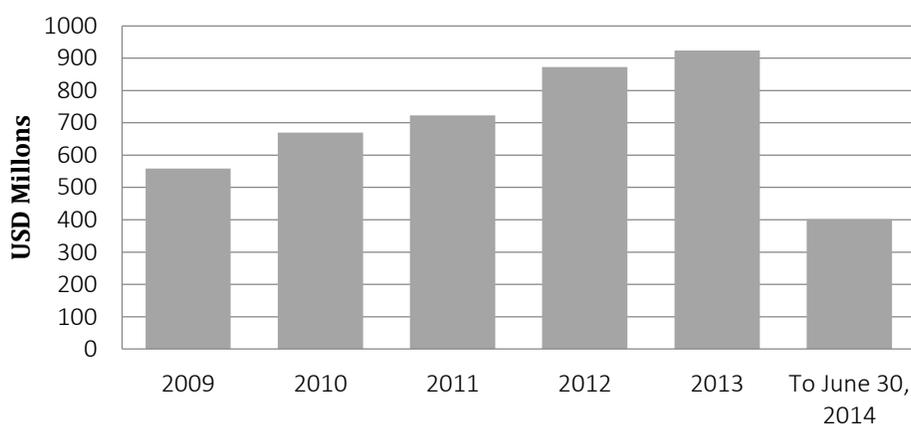
C.6.3 Structure

These are loan guaranties to FTFIs lending to the agricultural producers where a pre-determined percentage of capital of a specific loan is guaranteed. Since the FINAGRO reduces risks to FTFIs, FINAGRO plays a catalyzing role in mobilizing FTFI risk capital into Colombia's agricultural sector. In return for the FINAGRO guaranty, the first-tier financial intermediary must pay an annual commission fee, represented as a fixed percent of the guaranteed credit, to FINAGRO. The fixed percentage of the guaranty varies in accordance with the type of borrower and its underlying collateral package. Furthermore, the annual commission fee that FTFI must pay to FINAGRO is directly tied to the type of borrower.

C.6.4 Available Funding

As of December 2013, FINAGRO's AGF portfolio held 769,167 active guaranties worth approximately COP \$3.72 trillion (US\$1.99 billion).¹¹⁰ Of these guaranties, 773,892, or COP \$3.26 trillion (US\$1.74 billion), have been awarded to small-size agricultural producers.¹¹¹ In terms of new annual guaranty issuances, Figure 2 shows the growth of FINAGRO's AGF portfolio from 2009 until June 2014.

FIGURE 2. FINAGRO CREDIT GUARANTEE



Source: FINAGRO, 2009-2014.

¹⁰⁹ FINAGRO. (2014). "Manual de Servicios." Capítulo III: Fondo Agropecuario de Garantías – FAG. Retrieved from <https://www.finagro.com.co/normas/manual-de-servicios>. pp. 4-5. Accessed 24 July 2014.

¹¹⁰ FINAGRO. (2009-2014). "Estadísticas." Garantías Expedidas por Tipo de Productor 2009 - Junio 2014. Retrieved from <https://www.finagro.com.co/estad%C3%ADsticas/estad%C3%ADsticas>. Accessed 24 July 2014.

¹¹¹ Ibid.

C.6.5 Scaling Potential

The AGF is an innovative product that catalyzes lending activities of FTFIs that otherwise may not be possible if the loan guaranty product did not exist. In other words, the AGF enables FTFIs to greatly reduce the risks, or perceived risks, of expanding their portfolio into the rural agricultural space. Additionally, the AGF increases access to credit to agricultural producers who do not have a sufficient collateral package to access traditional agricultural credit products. With regard to the AGF's scaling potential, it has great promise in increasing formal financing in the agricultural sector. However, the factor limiting its growth is the cost of the guaranty. Although this cost is charged to the FTFI, it ultimately gets passed on to the borrower through variations in interest rate pricings.

C.7 RURAL CAPITALIZATION INCENTIVE (RCI)

C.7.1 Description

The Rural Capitalization Incentive (RCI) (*Incentivo a la Capitalización Rural, or ICR*) is a Government of Colombia sponsored and financed economic incentive program that provides funds to agricultural producers for various investment purposes, including (1) Land Improvement and Water Resource Management (*Adecuación de tierras y manejo de recurso hídrico*); (2) Production Infrastructure (*Obras de infraestructura para la producción*); (3) Biotechnology Development and its Incorporation into Productive Processes (*Desarrollo de biotecnología y su incorporación en procesos productivos*); (4) Agricultural Production Machinery and Equipment (*Maquinaria y equipos para la producción agrícola*); (5) Livestock and Aquaculture Equipment (*Equipos Pecuarios y Acuícolas*); (6) Fishing Equipment (*Equipos para pesca*); (7) Primary Transformation and Commercialization of Goods of Agricultural Origin (*Transformación primaria y comercialización de bienes de origen agropecuario*); (8) Planting, Maintenance, and Renewal of Late-Performing Crops (*Plantación, mantenimiento, y renovación de cultivos de tardío rendimiento*); (9) Silvopastoral Production System and Grassland Improvements (*Sistema de producción y mejoras de praderas*); and (10) Cattle Acquisition (*Adquisición de ganado bovino puro*).

Of the aforementioned RCI modalities, the SPS and Grassland Improvements product holds the most relevance for improving and furthering Colombia's SPS practices. Through this particular RCI, small- and medium-sized producers that develop SPS projects receive funding once the planting of non-timber forest and/or timber forest related forage associated with cattle production has been performed. In terms of the RCI benefit, producers receive an RCI equivalent to 40 percent of the entire project for the first 100 hectares of staged projects on the same land and 30 percent once the 100 hectares threshold is surpassed.¹¹²

C.7.2 Eligibility

To be categorized as a potential RCI beneficiary, the recipient must be either: (1) a small- or medium-sized individual producer; (2) a small producer association and/or cooperation composed only of small-sized producers; (3) a formal association and/or strategic alliance formed between small producers and other supply-chain actors with the objective of making discrete agricultural investments; (4) an enterprise with at least 20 percent of its capital originating from small-sized producers; and/or (5) an

¹¹² FINAGRO. (2014). "Manual de Servicios." Capítulo IV: Incentivo a la Capitalización Rural - ICR. Retrieved from <https://www.finagro.com.co/normas/manual-de-servicios>. p.13. Accessed 24 July 2014.

enterprise with at least 20 percent of its associates classified as small-sized producers.¹¹³ Additional eligibility requirements include proprietorship, possession, or tenure of the property, as well as other criteria designed to ensure repayment of existing loans once specific activities including SPS are implemented or for purchase of certified cattle.

C.7.3 Structure

The RCI is a subsidy that is provided to current FINAGRO clients with outstanding FINAGRO credit obligations from FTFI. The RCI is not directly provided to the producer client as a cash subsidy, but is rather used to reduce the producer's outstanding debt obligation to FINAGRO and the respective FTFI so as to ensure that proceeds of the subsidy will be used for the same investment project that the producer's FINAGRO credit is financing. The Government of Colombia provides financial resources for the RCI to FINAGRO on an annual basis, and MARD makes determinations as to which sectors are beneficiaries of the subsidiary.¹¹⁴ However, no RCI allocation may be greater than 40 percent of the overall investment in the project.¹¹⁵

C.7.4 Available Funding

As shown in the following Figure 3, funding for the RCI has grown substantially over the past five years, showing a gross increase of approximately 83 percent in funding from US\$90.65 million in 2009 to US\$165.79 million in 2013.¹¹⁶ Traditionally, small-size producers have been the main beneficiaries of the RCI program, representing 77.6 percent of all RCI subsidies in 2013 (medium-sized producers made up 22.2 percent and large-sized producers represented 0.2 percent).¹¹⁷ Regarding the sector, coffee producers received 42 percent of the issued RCIs in 2013 while cacao producers received 11 percent, cattle producers 10 percent, avocado producers 8 percent, and palm oil producers 7 percent.¹¹⁸

FIGURE 3. RCI ALLOCATIONS

¹¹³ Ibid. pp. 5-6.

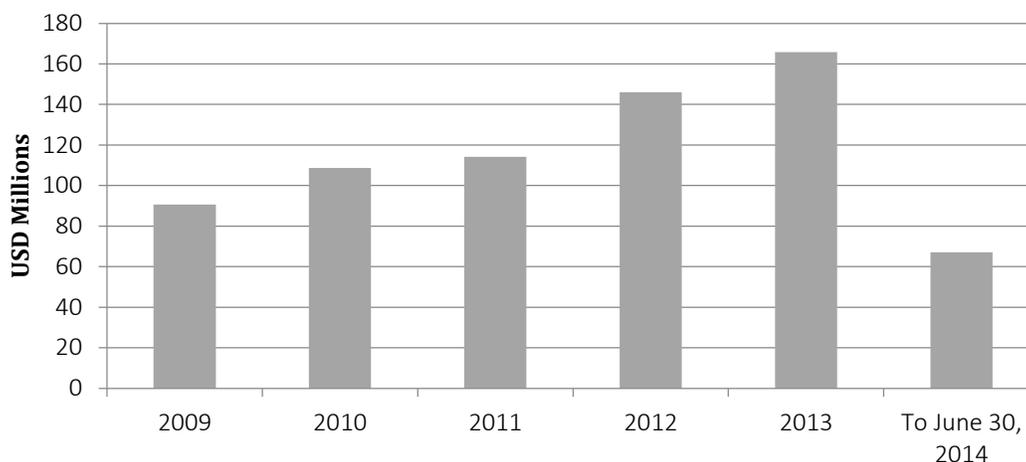
¹¹⁴ Ortegón, 2014.

¹¹⁵ FINAGRO. (2014). "Manual de Servicios." Capítulo IV: Incentivo a la Capitalización Rural – ICR. Retrieved from <https://www.finagro.com.co/normas/manual-de-servicios>. p.32. Accessed 24 July 2014.

¹¹⁶ FINAGRO, 2009-2013.

¹¹⁷ FINAGRO. (2014). "Informe de Gestión Sostenible 2013". Annual Report. Bogotá: Ministerio de Agricultura y Desarrollo Rural, 2014. p.63.

¹¹⁸ Ibid.



Source: FINAGRO. *Informes Anuales 2009 – 2013 and “Estadísticas” 2009 – 2014. Incentivos Otorgados Histórico Anual.*

C.7.5 Scaling Potential

In general, the RCI has a high scaling potential for the Colombian agricultural sector as a whole given its increasing Government of Colombia annual budget allocation. However, while there have been large increases in RCI funding since 2009, there also has been growing political indifference to using this resource to support the cattle industry versus other agricultural sectors. Given that the Government of Colombia prioritizes the RCI expenditures, the RCI has very limited scaling potential for the cattle sector as it depends on a more political, rather than commercial or demand-oriented, allocation process.

C.8 FORESTRY INCENTIVE CERTIFICATE

C.8.1 Description

Created in 1994, the Forestry Incentive Certificate (FIC) (*Certificado de Incentivo Forestal, or CIF*) is a program in which the MARD, in partnership with FINAGRO, recognizes 50-75 percent of the incurred costs associated with establishing and maintaining a forest plantation for up to five years.¹¹⁹

C.8.2 Eligibility

The following entities can access the FIC through an open call for proposals process:

- Any individual or enterprise of private nature;

¹¹⁹ FINAGRO. (2014). “Informe de Gestión Sostenible 2013”. Annual Report. Bogotá: Ministerio de Agricultura y Desarrollo Rural. p.66; And Ministerio de Agricultura y Desarrollo Rural. (2014). “Trámites y Servicios: Apoyos e Incentivos.” Certificado de Incentivo Forestal - CIF 2014. Retrieved from <https://www.minagricultura.gov.co/tramites-servicios/apoyos-incentivos/Paginas/Certificado-de-Incentivo-Forestal-CIF-2013-v2.aspx>. Accessed 1 August 2014.

- A decentralized municipal or district entity that provides either water and sewage public services;
- Departments, municipalities, districts, associations of municipalities or metropolitan areas, consortiums, and/or temporal unions; or
- Two or more private enterprises, in consortium or temporal union.¹²⁰

C.8.3 Structure

The FIC's payment structure is relatively simple, as it takes the form of a direct payment from participating FINAGRO FTFIs to selected recipients. The payment is regarded as a Government of Colombia recognition of the positive externalities that reforestation provides and is to be used for planting forest plantations for either protective or production means in land that is suited for the species.¹²¹ The payment covers a percentage of the costs of the following activities:

- Establishment of native species (50 percent of costs);
- Establishment of introductory species (50 percent of costs);
- Plantation maintenance (50 percent of costs); or
- Maintenance of natural forest area that is part of a forest establishment and management plan (75 percent of costs).¹²²

C.8.4 Available Funding

Between 2009 and 2013, the FIC has financed approximately COP \$87.27 billion (US\$46.24 million) in 827 reforestation projects covering 77,663 hectares. Figure 4 shows the evolution of this program over the past five years.¹²³

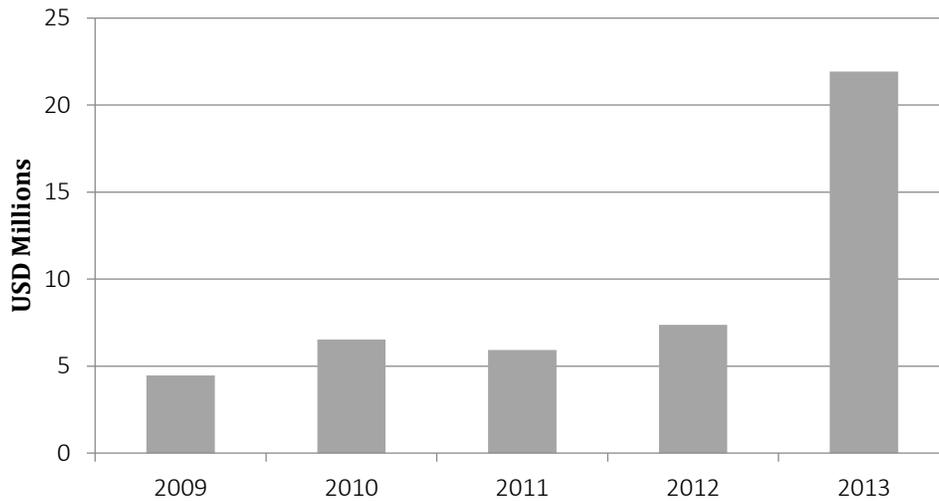
¹²⁰ Ministerio de Agricultura y Desarrollo Rural. (2014). "Trámites y Servicios: Apoyos e Incentivos." Certificado de Incentivo Forestal - CIF 2014. Retrieved from <https://www.minagricultura.gov.co/tramites-servicios/apoyos-incentivos/Paginas/Certificado-de-Incentivo-Forestal-CIF-2013-v2.aspx>. Accessed 1 August 2014.

¹²¹ Ibid.

¹²² Ibid.

¹²³ FINAGRO, 2009-2013.

FIGURE 4. FIC CONTRACT COMMITMENTS



Source: *FINAGRO, 2009-2013.*

C.8.5 Scaling Potential

In regard to the FIC's scaling potential, particularly in the context of sustainable SPS, there are two main factors to consider in order for this program to reach its full potential. Firstly, on the supply side, the Government of Colombia needs to continue to allocate resources to this incentive in order to promote reforestation not only as a way to reward positive externalities but also as a way in which the agricultural sector can increase its competitiveness and productivity in the medium and long term. Secondly, on the demand side, agricultural producers (particularly those in the cattle sector) need to be educated through high quality technical assistance programs about the benefits that forest plantations can have on their productivity and income.

ANNEX IV. GENERAL ROYALTIES SYSTEM

D.1 DESCRIPTION

In 2012, the Government of Colombia implemented a new system for the distribution and administration of royalty income originating from the exploitation of non-renewable natural resources. This new system, called the General Royalties System (GRS) (*Sistema General de Regalías*), differs from its predecessor, the Former Royalties System (FRS) (*Antiguo Sistema de Regalías*), in that it offers a more equal distribution of royalty income throughout Colombia. Previously, the FRS distributed 80 percent of its resources directly to those departments and/or municipalities where the exploration and extraction of non-renewable natural resources occurred, and the remaining 20 percent was allocated to the National Royalty Fund (*Fondo Nacional de Regalías*), thus concentrating the majority of royalty proceeds in relatively few geographies and generating even more inequalities in the county.¹²⁴ By contrast, the new GRS is a centralized Government of Colombia mechanism that distributes royalty income between all of the country's departments and municipalities through six different funds that aim to satisfy the following objectives:

- The creation of income distribution equality in order to generate savings in times of resource scarcity;
- The distribution of resources to the most impoverished populations, thus generating higher levels of social equality;
- The promotion of regional development and competitiveness;
- The provision of incentives to small, medium, and artisan mining energy-related projects;
- The promotion of integrating territorial entities in projects if shared-interest; and
- The provision of investment for social and economic restoration in territories where exploration and exploitation activities occur.¹²⁵

D.2 ELIGIBILITY

In terms of eligibility, any independent person can formulate and propose a project to their respective regional Administrative and Decision Making Board (ADMB) (*Órganos Colegiados de Administración y*

¹²⁴ Sistema General de Regalías. (2012-2013). "Sobre el Sistema General de Regalías (SGR)". Retrieved from <https://www.sgr.gov.co/Qui%C3%A9nesSomos/SobreelSGR.aspx>. Accessed 25 July 2014.

¹²⁵ Ibid.

Decisión, or OCAD).¹²⁶ However, it is more common for local government institutions at either the department or municipality level to present their respective projects to the regional ADMB for GRS financing. The ADMB must evaluate, assess viability, and prioritize each proposal. Once approved, the ADMB is also responsible for designating an implementer for each project.¹²⁷

D.3 STRUCTURE

The GRS is managed by a Steering Committee (*Comisión Rectora*) that is responsible for setting the overall policy and operations of the SGR and comprises chief executives from the National Planning Department (*Departamento Nacional de Planeación*); the Ministry of Mines and Energy (*Ministerio de Minas y Energía*); and the Treasury Ministry (*Ministerio de Hacienda y Crédito Público*), as well as two mayors, two governors, one national senator, and one national representative.¹²⁸

The GRS investment decision-making body is the ADMB of the respective region in which the investment will take place (there are several ADMBs throughout the country, each corresponding to various departments and/or municipalities). ADMB member composition includes majority-elected officials; local- and national-level public representatives; and representatives from the minority, ethnic, and indigenous communities.¹²⁹ Although investment decisions are decided by the respective regional ADMB, royalties are channeled through the GRS and administered by the National Planning Department through the following six funds:

- Science, Technology, and Innovation Fund (10 percent of total allocation): Seeks to foster economic development through investments in the science, technology, and innovation sectors.
- Regional Development Fund (24 percent of total allocation): Seeks to respond to the needs of a specific region and will benefit the most vulnerable populations in Colombia. Allocations will be determined based on poverty, unemployment, and population criteria.
- Regional Compensation Fund (16 percent of total allocation): Seeks to finance projects that improve living conditions in the poorest regions of Colombia. Funds will target populations living in border regions where most of the country's Afro-Colombian and indigenous communities are located. The fund is estimated to have 30-year duration and then will be transferred to the Regional Development Fund.
- Savings and Stabilization Fund (up to 30 percent of total allocation): Seeks to reduce royalty revenue volatility and foster economic stability.
- Territorial Pension Fund (10 percent of total allocation): Seeks to decrease the pension obligations of territorial entities.

¹²⁶ Berardo, K. (2014). "Colombia Natural Resources Royalty Program: Feasibility Assessment and Applications for Bond Financing." Internal Report. pp. 7-8.

¹²⁷ Ibid.

¹²⁸ Ibid. p.6.

¹²⁹ Ibid. pp. 7-8.

- Direct Allocation (10 percent of total allocation): Seeks to finance projects in departments and/or municipalities where non-renewable resources are extracted and where transport ports are located.¹³⁰

D.4 AVAILABLE FUNDING

Since its inception in 2012, the GRS has had an aggregate three-year budget of COP \$21.9 trillion (US\$11.65 billion), of which COP \$12.05 trillion (US\$6.42 billion) represents approved projects.¹³¹ Of the approved projects during this time frame, approximately 7.9 percent (US\$506 million) correspond to the agricultural sector, and 0.14 percent (US\$8.89 million) of this approved amount corresponds to the cattle-producing sub-sector.¹³² Leading the agricultural sector is the transport sector with 31.4 percent of all approved projects, the housing and urban development sector with 14.16 percent, and science and technology with 12.43 percent.¹³³

D.5 SCALING POTENTIAL

Given the amount of resources available in the GRS, this particular mechanism has a high scaling potential for the Colombia cattle-producing sector. However, civil society participation by individual, small-, and medium-sized producers in GRS financing applications will have to increase in order for the cattle sector to capitalize on this opportunity. Currently, the majority of approved GRS applications come from local government authorities. As such, approved projects are in sectors that can demonstrate rapid and observable improvements in public good sectors (i.e., transport infrastructure). Conversely, the cattle sector does not have as many apparent demonstrable public-good impacts as other sectors. Additionally, project funding, successful implementation, and completion only affect a small number of individuals rather than larger rural communities.

¹³⁰ Embassy of Colombia. (2011). "Colombia's Royalties Program: Fueling Fairness, Saving Equitable Growth."

¹³¹ Sistema General de Regalías. (21 October 2013). Mapa Regalías. Retrieved from <http://maparegalias.sgr.gov.co/>. Accessed 1 August 2014.

¹³² Ibid.

¹³³ Ibid.

ANNEX V. GOVERNMENT SUBSIDY AND INCENTIVE PROGRAMS

TABLE 9. DIRECT TECHNICAL ASSISTANCE ECONOMIC INCENTIVE¹³⁴

<i>(Incentivo Económico a la Asistencia Técnica Directa Rural)</i>	
Focus	Improve small- and medium-sized agricultural producer competitiveness and productivity in both domestic and international markets.
Call for Proposals Time Frame	May 20, 2013 – August 1, 2013
Project Execution Time Frame	FY 2013 – FY 2014
Available Funds	COP \$86,500,000,000 (US\$46.26 million)
Maximum TA Grant	COP \$367,500 (US\$197): COP \$294,000 (US\$157) incentive plus COP \$73,500 (US\$39) recipient counterpart
Proposals Accepted/Received	462/477
Funding Awarded	COP \$56,600,000,000 (US\$30.27 million)

¹³⁴ Ministerio de Agricultura y Desarrollo Rural. (11 July 2013). Apoyo e Incentivos: Incentivo Económico a la Asistencia Técnica Directa Rural. Retrieved from <https://www.minagricultura.gov.co/tramites-servicios/apoyos-incentivos/Paginas/default.aspx>. Accessed 1 August 2014; AND Ministerio de Agricultura y Desarrollo Rural. (2013). “Informe de Gestión”. Bogotá: Government of Colombia.

TABLE 10. SPECIAL TECHNICAL ASSISTANCE ECONOMIC INCENTIVE¹³⁵

(Incentivo Económico a la Asistencia Técnica Especial)	
Focus	Support the competitive productive processes of small-size producers in vulnerable social conditions (e.g., residing in regions of low rural development, low level of organizational development, limited ability to navigate state assistance, and limited ability to implement productive projects).
Call for Proposals Time Frame	May 20, 2013 – August 1, 2013
Project Execution Time Frame	FY 2013 – FY 2014
Available Funds	COP \$18,572,500,000 (US\$9.93million)
Proposals Accepted/Received	9/34
Funding Awarded	COP \$16,200,000,000 (US\$8.66 million)

TABLE 11. TRADE ASSOCIATION TECHNICAL ASSISTANCE¹³⁶

(Incentivo Económico a la Asistencia Técnica Gremial)	
Focus	Select and finance trade associations' technical assistance plans and educational programs for professionals providing the technical assistance
Call for Proposals Time Frame	May 20, 2013 – August 1, 2013
Project Execution Time Frame	FY 2013 – FY 2014
Available Funds	COP \$55,500,000,000 (US\$29.41 million)
Maximum TA Grant	Up to 50 percent of direct costs associated with the technical assistance program
Proposals Accepted/Received	12/12
Funding Awarded	COP \$9,700,000,000 (US\$5.19 million)

¹³⁵ Ministerio de Agricultura y Desarrollo Rural. Apoyo e Incentivos: Incentivo Económico a la Asistencia Técnica Especial. 2 July 2013. 1 August 2014 <https://www.minagricultura.gov.co/tramites-servicios/apoyos-incentivos/Paginas/default.aspx>; AND Ministerio de Agricultura y Desarrollo Rural, Informe de Gestión 2013. Bogotá: Government of Colombia, 2013.

¹³⁶ Ministerio de Agricultura y Desarrollo Rural. Apoyo e Incentivos: Incentivo Económico a la Asistencia Técnica Gremial. 10 July 2013. 1 August 2014 <https://www.minagricultura.gov.co/tramites-servicios/apoyos-incentivos/Paginas/default.aspx>; AND Ministerio de Agricultura y Desarrollo Rural, Informe de Gestión 2013. Bogotá: Government of Colombia, 2013.

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